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PIT AND QUARRY

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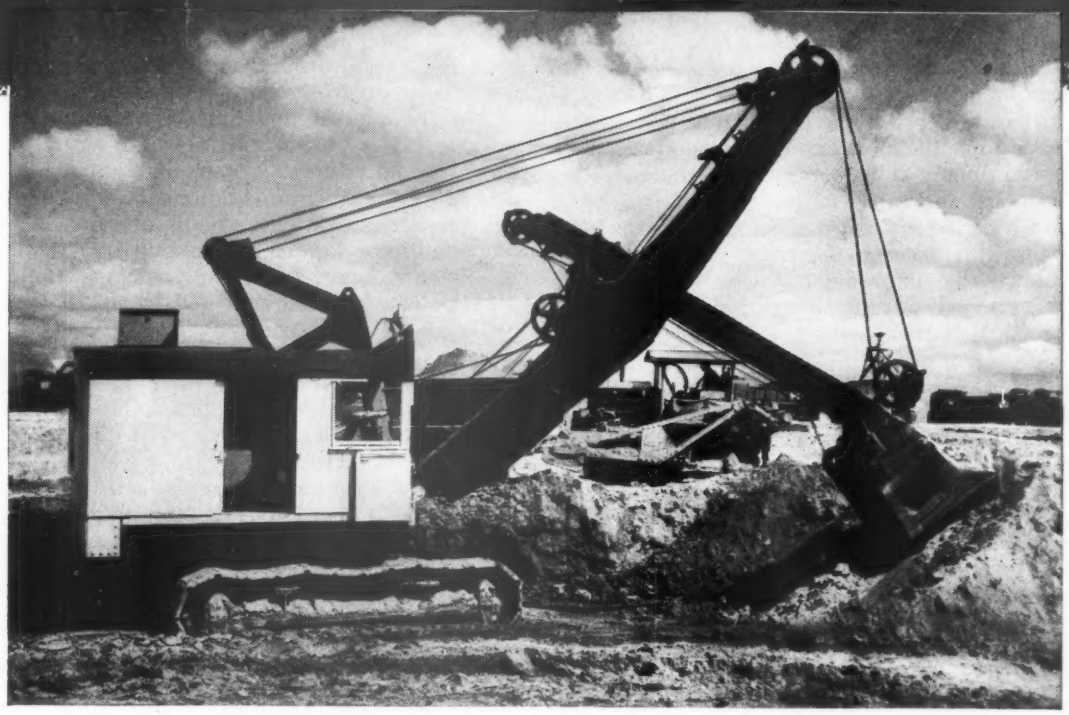

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EDITORIAL

The Cement Industry Wins Another Round

THE Seventh U. S. Circuit Court of Appeals in Chicago on September 20, 1946 handed down a decision vacating the Federal Trade Commission's "anti-trust" order to the cement industry to "cease and desist" selling cement on a delivered-price multiple-basing-point system. This decision defeated the Commission's aim of declaring illegal the selling of cement by various producers at the same price at the same place. In doing this the Court took perhaps the most important step to date toward freeing this and other important industries from a form of persecution which has been carried on for many years at great cost to these industries and to the taxpayer, and which has not helped the standing of these industries in the eyes of the public. The case is generally considered to be the most important one to date concerning sales and pricing policies in industries manufacturing heavy, standard and interchangeable materials. More than 30 nation-wide industries are affected by this decision.

In arriving at this decision the court wisely refrained from going down the many bypaths which would have confused the issue and concentrated entirely on the legality of the multiple basing point price system. It was, therefore, able to give concentrated attention to this subject and to render a clear-cut decision that "no restraint on competition was effected by use of the basing point price system." The court also declared that (1) The existence of identical prices for cement is not the result of a conspiracy or an agreement in restraint of trade and competition; (2) "the question as to whether the multiple basing point price system should be declared illegal rests clearly within the legislative domain," and has never been answered there; (3) "it is the inevitable result of any pricing system that cement must be sold at the same place at a uniform price whether it be at the point of production or that of destination."

The Court's decision upheld the producers' right to absorb freight costs where necessary to meet the prices of competitors located nearer to a particular market. The formula used to make the method operative, the Court said, is that the delivered price at any location shall be "the lowest combination of base price plus all-rail freight." The Court also stated that "the restraint which the Commission professes to discern, effected by freight absorption, is insignificant as compared with that which would result if each sold only in its own backyard, as the Commission would have them do."

That the multiple basing point price system has not stifled competition and prevented the entry of new producers into the field is evident from the fact that new plants have been built during all periods when the demand for cement was high and the materials for the construction of new plants were available. At the present time definite plans are under way for the construction of at least one such plant. At least three other new plants are now under construction by established producing companies and others are planned. Many major improvement programs to existing plants are under way and only a shortage of equipment is holding up others. Programs under way or soon to be started involve the expenditure of many millions of dollars annually. These expenditures are being made by these companies to meet competition and to produce better cement at the lowest possible cost.

That this system does not put small independent companies at a disadvantage is evident from the fact that few such plants have been forced out of business even during the depression of the early "thirties". Most of the failures which did occur were due to a lack of business acumen on the part of these owners, exhaustion of deposits, extreme obsolescence or some other sound economic reason.

A study of the average mill prices for which cement has been sold in the United States over a period of many years should make it apparent to anyone that this is one industry in which competition is so keen that prices have never been above a reasonable level. There have been local price wars which have resulted in operating losses to the companies involved and there has undoubtedly been some local profiteering where one operator had the advantage, but there is no evidence that any large part of the industry at any time enjoyed unreasonably high prices. Prices at the mill now are actually lower than they were 50 or even 25 years ago, and the price curve is devoid of the sharp fluctuations found in those of almost any other commodity. This is in spite of the fact that the most important costs entering into the manufacture of cement: labor, plant and equipment, materials and supplies, etc., have all increased greatly during this period.

To an unbiased observer it must be evident that, as long as there is no collusion within the industry in fixing mill prices for cement—and the FTC has definitely stated that there is no evidence of such collusion—it matters little how delivered prices are arrived at. In any case location and low production cost give a mill an advantage to which any business venture is entitled. Most cement plants are now selling on the multiple base system. Most of these have their own base price, charging that base plus freight wherever they can, but absorbing freight where necessary to meet a competitor's lower price. This practice the Court held valid. The companies that do not have their own base price but, merely meet their competitors' price in all instances, were given a clear warning that the practice is illegal in that it involves collection of phantom freight. Another system of pricing, used only on the Pacific Coast is a zone-pricing system. The Court did not pass on its validity. The multiple basing point system, however, has been most widely used for the past 40 years or more and is preferred by the majority of producers, re-sellers and users of cement.

This suit is only one of a series with which the cement and other bulk commodities industries have been bedeviled for over 25 years. Still before the cement industry is the near certainty that the FTC will carry this case to the Supreme Court which once before, in 1925, exonerated producers from the original charges of the Department of Justice that they were in conspiracy to fix prices in violation of the Sherman Anti-Trust Act. The decision of the highest court in this case should again clarify temporarily the status of the multiple basing point system of prices under the Federal Trade Commission Act and the Robinson-Patman Act.

Still ahead of the industry is another suit brought by the Department of Justice in Denver against the same defendants charging that the same practices involved in the FTC case violate the Sherman Anti-Trust Act. These are the same charges of which the Supreme Court cleared the industry in 1925.

If the Supreme Court affirms the Chicago court's decision the validity of the multiple-basing system, insofar as the Robinson-Patman Act is concerned, will be established. Future charges of conspiracy or agreement in the use of the system may of course be brought at any time.

ROCK PRODUCTS AND QUARRY

CHICAGO NOVEMBER, 1946

OPA Hikes Manufacturers' Ceiling Prices on Lime for Area West of Rocky Mts.

An increase of $1 per net ton in the manufacturers' ceiling price for building, chemical and industrial lime (except agricultural lime) produced in the area west of the Rocky Mountains, has been announced by the Office of Price Administration. The action, effective October 12, 1946, extends to this area the increase of $1 per net ton granted producers east of the Rocky Mountains on July 26, 1946. It is necessary, OPA said, in order to restore western area manufacturers' current earnings to base period levels.

Resellers, as required by law, are permitted to maintain their percentage mark-ups by adding 1.5 cents per net ton to their maximum prices for each one-cent-per-net-ton increase allowed their supplying producer.

Marquette Employees Feted for Safety Record

Honored guests at a picnic a few weeks ago were the 70 employees of the Marquette Cement Manufacturing Company's plant at Oglesby, Illinois, who had worked 2,000 consecutive days without an accident. They were entertained at the farm of Ralph Moyle, plant superintendent.

The picnic, sponsored by Frank Moyle, plant director of operations, was the fulfillment of a promise made by Mr. Moyle in October, 1943, when almost the same group of men had recorded 1,000 days without an accident. At that time they were told that upon completion of 2,000 days of accident-free work they would be guests at a picnic. The men achieved their goal on July 9.

50 Types of Building Items Put Under Export Control

More than 50 items of building materials and equipment essential to the Veterans Emergency Housing Program have been placed under export control during recent weeks, Housing Expediter Wilson W. Wyatt has announced. Approximately 100 items of similar nature previously had been under such control.

The Office of International Trade of the Department of Commerce, which exercises control over exports, acted on the recommendation of the National Housing Agency, of which Mr. Wyatt also is administrator, and the Civilian Production Administration.

The following commodities were among the items put under export control as of August 20: standard portland cement; white nonstaining and other cement, except Keene's and refractory cements; gypsum; and concrete block machines.

Freed from OPA restrictions by a recent ruling were imported flint lining blocks and pebbles for pebble mills and quartz crystals of all grades and qualities.

Coming Events

January 27-29, 1947 — Chicago. 30th annual convention, National Crushed Stone Association, Edgewater Beach Hotel. (No exhibits.)

January 27-30, 1947 — Chicago. 28th annual convention, Associated General Contractors of America, Inc., Stevens Hotel.

January 30-31, 1947 — Chicago. Second annual convention, Agricultural Limestone Division, National Crushed Stone Association, Edgewater Beach Hotel. (No exhibits.)

February 16-20, 1947 — New York. Annual meetings, American Institute of Mining and Metallurgical Engineers, Hotel Pennsylvania.

March 3-5, 1947—Los Angeles. 31st annual convention, National Sand & Gravel Association, Biltmore Hotel. (No exhibits.)

March 17-22, 1947—New York. 75th anniversary celebration, American Institute of Mining and Metallurgical Engineers, with World Conference on Mineral Resources, Waldorf-Astoria Hotel.

New York Crushed Stone Association and Guests Hold Annual Outing

Approximately 140 persons recently attended the outing of the New York State Crushed Stone Association at Schuyler Meadow Club, Loudonville, New York. Officials of the New York Public Works Department, the State Department of Standards and Purchase, the State Labor Department, the Federal Bureau of Public Roads and the National Crushed Stone Association and other guests were also present.

Those in charge of various sports events were Thomas Brady, H. E. Coleman, MacLaren Richards, J. Shuman Hower, John Brandenburg, George E. Schaefer, Hiram W. Barnes, Guy W. Faylor, Brayton R. Babcock, Jr., and J. V. Owens. Winners were as follows: golf tournament, Wilson P. Foss, Jr.; kickers' handicaps, G. P. Engelmann (J. L. Hemphill and Company); putting contest, C. J. Lambertson (Marion Power Shovel Company); driving contest, D. B. Clark (Shell Oil Company); and horseshoe pitching contest, George Schaefer (General Crushed Stone Company).

The general committee in charge of the outing included W. P. Foss, Jr., C. A. Munz and J. R. Callanan (chairman).

J. W. Follin Appointed To Federal Works Post

The appointment of James W. Follin of Washington, D. C., as assistant administrator of the Federal Works Agency has been announced by Major General Philip B. Fleming, Federal Works Administrator.

Mr. Follin since 1939 has been managing director of The Producers' Council, Inc., a national organization of manufacturers of building materials and equipment. He has also been affiliated with the Associated Pennsylvania Contractors, a state-wide trade association of general contractors, was secretary of the Philadelphia Building Chapter of this association, and also has worked with the Pennsylvania Department of Highways and the National Institute of Public Administration of New York. He is a member of the Public Works Construction Advisory Committee of the Federal Works Agency.

Millions Allocated for Improving Inadequate Highways of California

California's state highway system, built when the state's population was only half what it is today, is "literally breaking open at the seams," Gov. Earl Warren declared in an address at the recent convention of the League of California Cities in San Diego.

Reporting on the progress of corrective action, he disclosed that California highway construction contracts totaling $52,000,000 have been awarded since last November and awards up to $135,000,000 will be made "as rapidly as the construction industry can absorb them during the next two years."

Oklahoma Minerals Group Holds Annual Meet at Ada

Ada, Okla., has been chosen as the meeting place of the annual Oklahoma Mineral Industries Conference, scheduled for November 7 to 9. Among those on the board of directors are the following representatives of the nonmetallic minerals industries: H. A. Barndollar of the Barndollar-Crosbie Company, Ada (asphalt); Claud Rodarmel of the Oklahoma Portland Cement Co., Tulsa; C. W. Gould of the Oklahoma Silica Sand Co., Ada; Homer Dunlap of the St. Clair Lime Co., Oklahoma City; F. J. Pierce of the Federal Building Material Co., Sand Springs (rock wool); Herbert Gray of the Standard Paving Co., Tulsa (stone, sand and gravel).

Tennessee Firm Adds New Equipment and Product

The Carlin-Howell Corporation, which recently took over all of the activities and properties of the former Burgess Lime & Stone Company at Doyle, Tenn., has installed modern machinery and equipment for the production of limestone products. J. C. Carlin is president and E. W. Howell is secretary-treasurer.

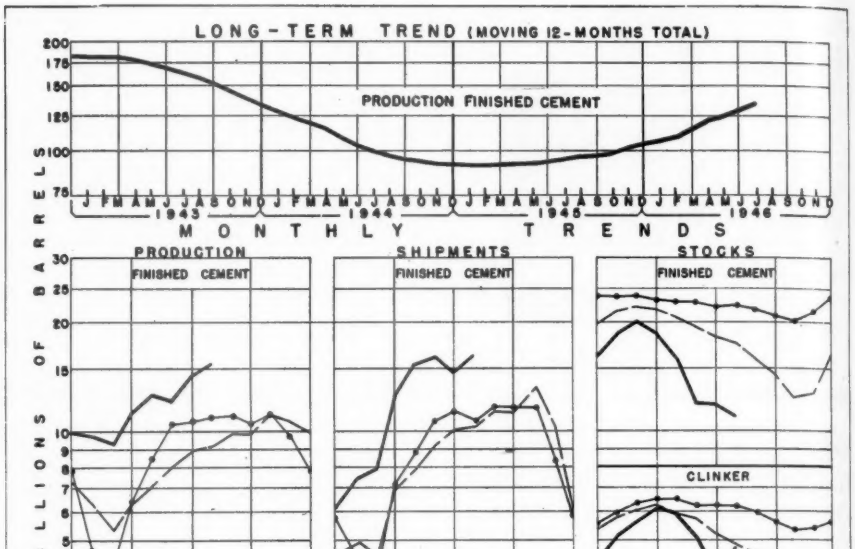
The Carlin-Howell Corporation will continue to develop their properties and, in addition to agricultural lime and crushed stone, will market in the near future high calcium limestone for the chemical industry. The quarry is at Doyle and the main offices are at Nashville.

Rich Vermiculite Deposit Acquired by California Firm

Barrimore & Sons of Hollywood, Calif., have purchased a rich vermiculite deposit near Silver Peak, Nev., from the Crawford, Markham, Nichol interests of Bishop, Calif.

The mineral is present in a rare concentrated form, and tests indicate its quality is equal or superior to that being mined in Montana. It occurs in a vein about three feet wide.

Barrimore & Sons are planning to ship the vermiculite to a plant at Anaheim, Calif., where it will be exfoliated and processed. It will be marketed as an insulating material and possibly for lightweight aggregate in concrete.



Production of 15,420,000 barrels of cement in July, 1946, reported to the U. S. Bureau of Mines, was 67 percent greater than that reported for July, 1945. Shipments of 16,250,000 barrels were 58 percent greater than those reported for the corresponding month of 1945. The extensive and growing building construction program is evidently having a stimulating influence on cement plant activity. Mill stocks on July 31 were 7 percent lower than on June 30, 1946, and 37 percent lower than a year ago. Clinker production of 15,347,000 barrels in July, 1946, was 73 percent above that reported for July, 1945. The industry operated at 75 percent of capacity in July, 1946, as compared with 73 percent in June, 1946, and 45 percent a year earlier. Cumulative figures for the first seven months of 1946 show a gain of 65 percent in production, 67 percent in shipments, and 68 percent in clinker production, as compared with the similar period of 1945. Demand for cement, as indicated by mill shipments, was higher than in July, 1945, in all continental districts and in Puerto Rico, but was lower in Hawaii. In several states, particularly in the Middle West, shipments were more than double those of July, 1945. The long-term trend in production of finished cement is indicated in the accompanying chart. Trends in production, shipments, and stocks are also indicated graphically, as compared with the 1935-39 average.

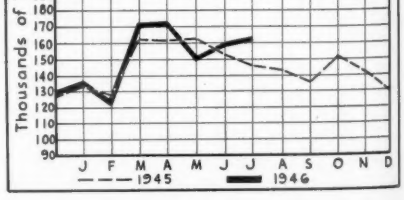
Warren Hancock, who recently purchased the Fluft Rok plant at Mason, Nevada, has announced that he plans resumption of operations.

The plant will open with a crew of 22. T. I. Park, who has been with the plant since November, 1944, will be in active charge of production.

The company's output will be confined to insulation, concrete and aggregate.

The most acute shortage of freight cars ever experienced in the United States is predicted for this Fall. It is hoped that increased demurrage rates will encourage rapid turnover of cars.

Perishables, especially foods, may be given preference on rail car allocations. Since bulk quicklime is a perishable, the lime industry may benefit from this possibility.



According to data collected by the National Lime Association, 47 companies in July, 1946, shipped 162,482 tons of lime (94,636 quicklime; 67,846 hydrate). Reporting companies represent 43.1 per cent of the association members' total capacity of record. Based on Pit and Quarry's estimates for the remainder of the industry, the total shipments for the month for all plants were approximately 415,000 tons. Shipments of lime by users for July, 1946, were:

Use	Quicklime (tons)	Hydrate (tons)
Agricultural	774	11,844
Building	11,478	30,199
Chemical	82,384	25,803
Total	94,636	67,846

Ash Grove Organization Announces New Staff Of Executives for 1946-47

The Ash Grove Lime & Portland Cement Company, Kansas City, Mo., has announced several executive changes, effective October 1, 1946. L. T. Sunderland, formerly president, becomes chairman of the executive committee; W. P. Sabin, vice-chairman of the board; Allan B. Sunderland, president and secretary; L. Kittle, executive vice-president and treasurer.

Paul Sunderland, as chairman of the board, will direct construction, operation, and maintenance of the company's manufacturing facilities. Formerly he was general superintendent of the company's lime plants, and in that capacity supervised the installation and operation of modern plant equipment. His course at the University of Wisconsin was interrupted by World War I, during which he served in the U. S. Navy, later engaging himself in the service of the Interstate Machinery and Supply Company at Omaha. Starting with Ash Grove in 1923 during the infancy of present lime production methods, he has become widely known in lime manufacturing circles, and he is at present a member of the Board of Directors of the National Lime Association. His headquarters have been transferred from Springfield, Mo., to the general office in Kansas City.

Allan B. Sunderland's election to the presidency of the 64-year-old Ash Grove Company, to succeed his father, climaxes 24 years of active service, during which he progressed through almost every department of the company, including the manufacturing plants. He spent several years on the road as a territorial salesman, later being promoted to the sales department of the general office, in which he has risen to his present executive position. Mr. Sunderland's wide trade acquaintance resulting from sales work has given him an intimate knowledge of dealer and contractor problems in the merchandising and use of lime and cement. In addition to his new executive responsibilties, he will continue in charge of the company's sales, advertising, purchasing, and traffic.

L. Kittle, executive vice-president and treasurer, has been in the Ash Grove service for 27 years, starting as a clerk in the Chanute plant office in 1919. He will handle matters pertaining to finance, accounting, and labor relations. He succeeds W. P. Sabin, whose service with the company began in 1908, and who in his new office as vice-chairman of the executive committee will assist L. T. Sunderland, the new chairman.

American Foundrymen's Assn. Forms New Sand Division

The formation of a sand division within the American Foundrymen's Association, technical society of the castings industry, has been announced by S. C. Massari, technical director. Seventh of the association's technical groups, the new division is an outgrowth of a sand research project started in 1921.

The chairman of the division is Dr. H. Ries, of Ithaca, N. Y., former head of the geology department of Cornell University and an internationally known sand and clay authority who has been technical advisor to the society's sand project since 1929. P. E. Kyle, professor of metallurgy, Cornell University, is vice-chairman; and H. F. Scobie, A.F.A. educational assistant, is serving temporarily as division secretary.

Photographic Prevention Plan Aids Safety Effort

Ken Wright, safety supervisor at the Portsmouth, New Hampshire, plant of the National Gypsum Company, is the originator of a plan for rendering the accident hazards of industry more realistic and memorable. He is having photographs made of the ways in which various accidents have happened at the plant, with the idea of preventing recurrences. A model poses for the employee's mistake or careless act which led (or could lead) to a mishap. Such photographs are then furnished with appropriate legends and posted throughout the plant.

Drilling, blasting, crushing, screening, and electrification are only a few of the many subjects completely covered in the 23 chapters in the Pit and Quarry Handbook.

Bates Addresses Engineers Stresses Need for Free Research in America

Research and National Strength was the subject of a luncheon address on October 15 by Dr. A. Allan Bates, recently appointed vice-president for research and development for the Portland Cement Association. Speaking before the Chicago Engineers Club, Dr. Bates outlined the important role of research in determining the ultimate success or failure of the major contestants in World War II.

The speaker expressed fear that America is today falling prey to the kind of internal dissension which undermined France and left her helpless before the Nazi tide. Our system of free enterprise, he pointed out, must expand constantly or perish. Neither the present peace nor future wars can be won unless American science, engineering and technology are permitted to grow and prosper.

Road Building Bogged Down By Shortages, Priorities

Three million miles of war-torn roads will shame the United States for the next few years—a jagged, bum scar on the nation's face, says *Pathfinder* news magazine.

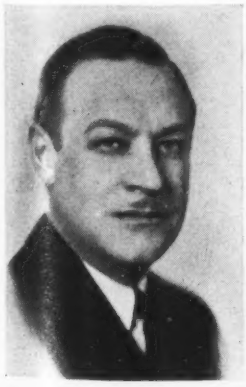
Given the go sign by President Truman and blessed by a generous Congress, the sorely-needed road building program has only bogged down.

States were never in better shape for plans and funds. Federal grants are the largest ever—1.5 billion dollars for a three-year face-lifting. Revenues from gas and license taxes are 40 percent higher than 1940 receipts. Unused funds lie musty in state vaults.

Nevertheless, rugged road blocks obstruct the Federal Bureau of Public Roads and every state highway department.

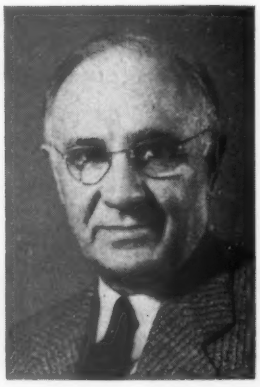
Builders say they are detoured by labor, equipment and materials shortages. Graders, steam shovels, tractors and concrete mixers are unobtainable. Estimates place immediate minimum needs at 225 million dollars.

The few pieces of equipment that sift through WAA sales are snapped up by South American countries (priority buyers under U. S. Latin-American policy), UNRRA or veterans.



A. B. Sunderland

Paul Sunderland



W. P. Sabin

Lawrence Kittle

L. T. Sunderland

Tobin Quarries Handles Riprap-Gravel Facing Of Huge Kingsley Dam

Kingsley Dam, north of Ogallala, Nebraska, is currently being refaced on the upstream side with a 3-foot layer of quarried limestone riprap. Beneath this a filter face of ¼- to 2½-inch gravel is being placed to prevent the washing away of dam material. This new facing replaces the precast concrete riprap installed in 1941, which failed when unforeseen wave-action caused it to collapse. The huge dam forms Lake McConaughy, one of the main reservoirs of the Central Nebraska Public Power and Irrigation District.

Tobin Quarries of Kansas City, who are handling the resurfacing work, are importing 35 cars of limestone per day from Wyoming for the riprap. Gravel for the filter face is being hauled in from a nearby 200-ton-per-hour screening plant, where usable gravel is separated from rough, pit-run mixture. This rough material is obtained from Tobin's 2-square mile pit area consisting of small hills of sand, clay and gravel. However, gravel formations there are spotty, running from 2 to 10 feet deep, and carry a large percentage of sand.

To salvage this needed gravel, the firm is using 3 Tournapulls to strip the knolls of earth and sod. The Tournapulls then load the gravel mixture and haul it to the screening plant grizzly, where it is dumped onto a conveyor. The resulting screened gravel is bin-loaded into trucks that haul it to the dam face for spreading.

Meanwhile, the Tournapulls, after dumping their loads, pull around under the hopper, and are loaded with waste sand, which is hauled back to the mined-out areas and dumped. Haul distances for high-speed units range up to 4,000 feet, over haul roads that are kept as level as the terrain will permit. Difficult working conditions are intensified by high winds and dust.

Oregon Reports Progress On Post-War Highway Plans

Although delayed by material shortages and the reluctance of contractors to bid on some of the jobs, Oregon's post-war highway construction is progressing satisfactorily, according to announcement made by State Highway Engineer R. H. Baldock.

He said contracts totaling approximately $9,000,000 had already been awarded and that the amount would be increased to about $16,000,000 by the end of the current year. The state's entire post-war highway program involves an outlay of approximately $36,000,000 of state and federal funds over a three-year period.

Wyoming Gypsum Mine Installs New Equipment

The Sulphur Springs Gypsum Company started installation of new equipment at its open pit mines northwest of Thermopolis, Wyo., in October. It is expected that operations will be resumed in the near future. According to Harry Adams, vice-president, Anderson Brothers of Lewistown, Mont., have been given a five-year contract to mine and sack gypsum.

Decrease in Residential Construction Volume Halted During August

The steady decline in investment commitments for new housing construction, as revealed in contracts awarded, from the high level of $463,600,000 in May, was arrested in August in the 37 states east of the Rocky Mountains, it was reported by F. W. Dodge Corporation.

The Dodge corporation reported, however, that a downward residential building contract spiral occurred in August in New England, metropolitan New York, northern New Jersey, Louisiana, Mississippi, Minnesota, the Dakotas, and the St. Louis marketing area.

The gains in other areas were sufficient to bring the overall volume of new residential contracts during August to $284,025,000, as compared with $281,227,000 in July. The greatest gains were in the Southeastern states, Ohio, Kentucky, southern Michigan, upstate New York and Texas. It was revealed that 39,953 dwelling units are to be provided under the contracts awarded last month.

Contracts awarded for nonresidential construction and heavy engineering works declined from $436,764,000 in July to $395,884,000 in August. The total of all building and construction contracts awarded in August in the 37 Eastern states was $679,909,000, as compared with $717,991,000 in July. Thirty percent of the August volume was classified as publicly-owned.

Grand Rapids Firm Bought By One of Three Partners

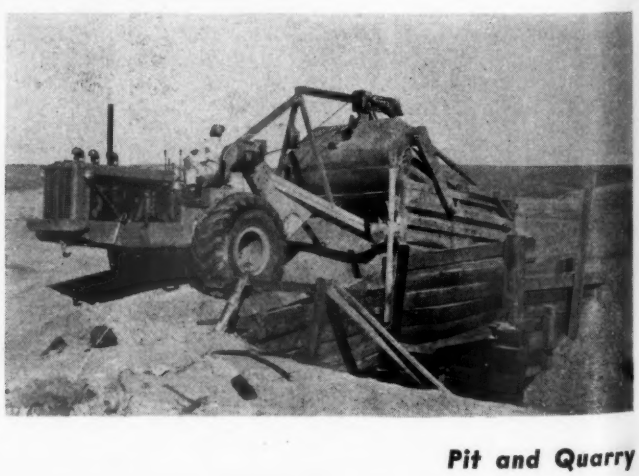
As announced by Theodore H. Zeeff, the H. Zeeff & Sons Gravel Company of Grand Rapids, Mich., has been dissolved and all property, assets and equipment have been taken over by him. (The owners formerly were Harry Zeeff and sons, John and Theodore H.) The company name and address on Maynard Avenue near Butterworth Road will remain the same.

The firm produces washed sand and gravel, road gravel and crushed stone. It also operates a portable gravel plant on its property.

• Right: Gravel from the pit area being pusher-loaded at the Tobin Quarries.

• Below, left: This big, rubber-tired rig makes the complete round trip from plant to dumping area in 11½ minutes.

• Below, right: A load of pit-run mixture being dumped through the grizzly on a conveyor belt which feeds the screening plant.



Mahoning Begins Expansion At Rosiclare Flotation Mill and Drying Plant

A 50 percent expansion of the flotation mill and drying plant of the Mahoning Mining Company has been started at Rosiclare, Ill. Orders have been placed for additional equipment, according to John G. Trewartha, vice-president. Work will advance as equipment deliveries are made. The Mahoning Company, which recently began operation of the Wano fluorspar mill at Jameston, Colo., also plans expansion of the Colorado mill to increase the capacity from 60 to 80 tons per day. R. K. Wisco, general superintendent of the Rosiclare mill, recently returned from an inspection of the Colorado plant.

Materials Handling Exhibit Scheduled for January 14-17

Plans have been shaping up for the first national Materials Handling Exposition, which will be held from January 14 to 17, 1947, at the Public Auditorium in Cleveland, O. Various types of equipment and machinery will be exhibited, and all phases of materials handling will be discussed, with special attention to problems of stone and stone products. On exhibition will be hoists, hoist mountings, cranes, derricks, conveyors, hand and power trucks, skids and pallets, tractors and trailers.

Earl I. Burke, manager of shipping for Republic Steel Company, heads the exposition's policy committee. Others in the group are T. O. English, assistant chief purchasing agent for the Aluminum Company of America, and Col. Albert B. Drake, materials handling engineer for Drake, Stevenson, Sheahan, Barclay, Inc., of New York. Admission to the sessions may be obtained from the exposition management, Clapp & Poliak, Inc., 37 Wall Street, New York, N. Y.

Pennsylvania Stone Producers Hold Annual Outing at Carlisle

The annual summer outing of the Pennsylvania Stone Producers Association and the Agricultural Limestone Division was held this year at the Carlisle Country Club at Carlisle, Pa., on August 23, 1946. Representatives from the Pennsylvania Department of Highways, the Department of Labor and Industry and many of the other government agencies were present. (See illustrations below.)

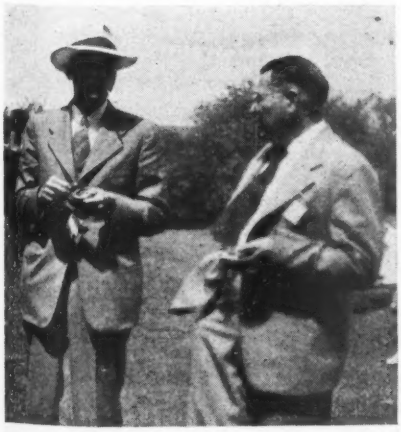
National Council's New Safety Booklet Available To All Plant Operators

Safety in Quarry Operations—the revised issue of the original *Standards for Safety in Quarry Operations*—which was announced in the September number of PIT AND QUARRY (page 79), is now available to non-members of the National Safety Council, as well as to members. Readers wishing to secure the pamphlet may write to the National Safety Council, Inc., 20 North Wacker Drive, Chicago. The price, per single copy, is 80 cents.

It has been announced by Northwestern University that a $4,000 grant from the International Minerals & Chemicals Corporation will be used for research in phosphate fertilizer production.

Approved by the Civilian Production Administration for the Indianapolis district was a project submitted by the Louisville Cement Corporation for a $100,000 addition to its Speed, Ind., plant.

• Above, left: O. D. Decker, General Crushed Stone Co., Mansfield, Pa.; G. E. Schaefer, district sales manager, General Crushed Stone Co., Rochester, N. Y.; J. P. Peacock, general manager, Stone and Slag Division, Bethlehem Steel Co., Bethlehem, Pa.; T. C. Frame, chief engineer, Pennsylvania Department of Highways; and J. L. Holden, Genesee Stone Products Corp., Batavia, N. Y. • Above, right: J. P. Peacock; W. H. Chesnut, secretary, Pennsylvania Department of Labor and Industry; and O. M. Graves, president, General Crushed Stone Company, Easton, Pa.



• E. A. Weymouth (left), Pittsburgh Limestone Corp., Pittsburgh, with H. H. Wagner, general manager, Pennsylvania Stone Producers Association.

• Harry Strauss, Annville Stone Co., Harrisburg, Pa.

• Nick Cassetti (left), Stowe Trap Rock Co., Philadelphia, with H. R. Brennerman, The John T. Dyer Quarry Co., Birdsboro, Pa.

Newly-Formed Gager Firm Plans to Expand Output of Lime and Limestone

According to word from James M. Gager Jr., the Gager Lime Manufacturing Company of Sherwood, Tenn., has been purchased by him and two associates, W. J. Mills and F. M. Ferguson. All stock has been taken over and a 30-year lease has been taken on the plant and on 5,000 acres of land at Sherwood. The new corporation, to be known as the Gager Lime Company, has established a temporary sales office at 530 Volunteer Building, Chattanooga. The main offices will remain at Sherwood.

Officers of the new firm are as follows: W. J. Mills, president; F. M. Ferguson, general manager; J. M. Gager Jr., sales manager; Thomas Saterfield, secretary-treasurer; Aubrey Garner, plant superintendent. Plans are contemplated for enlarging the plant, which at present has a capacity of 5,000 tons of burned lime per month and 12,000 tons of ground and crushed limestone.

$25,000,000 Expansion Plan Launched by Wyandotte

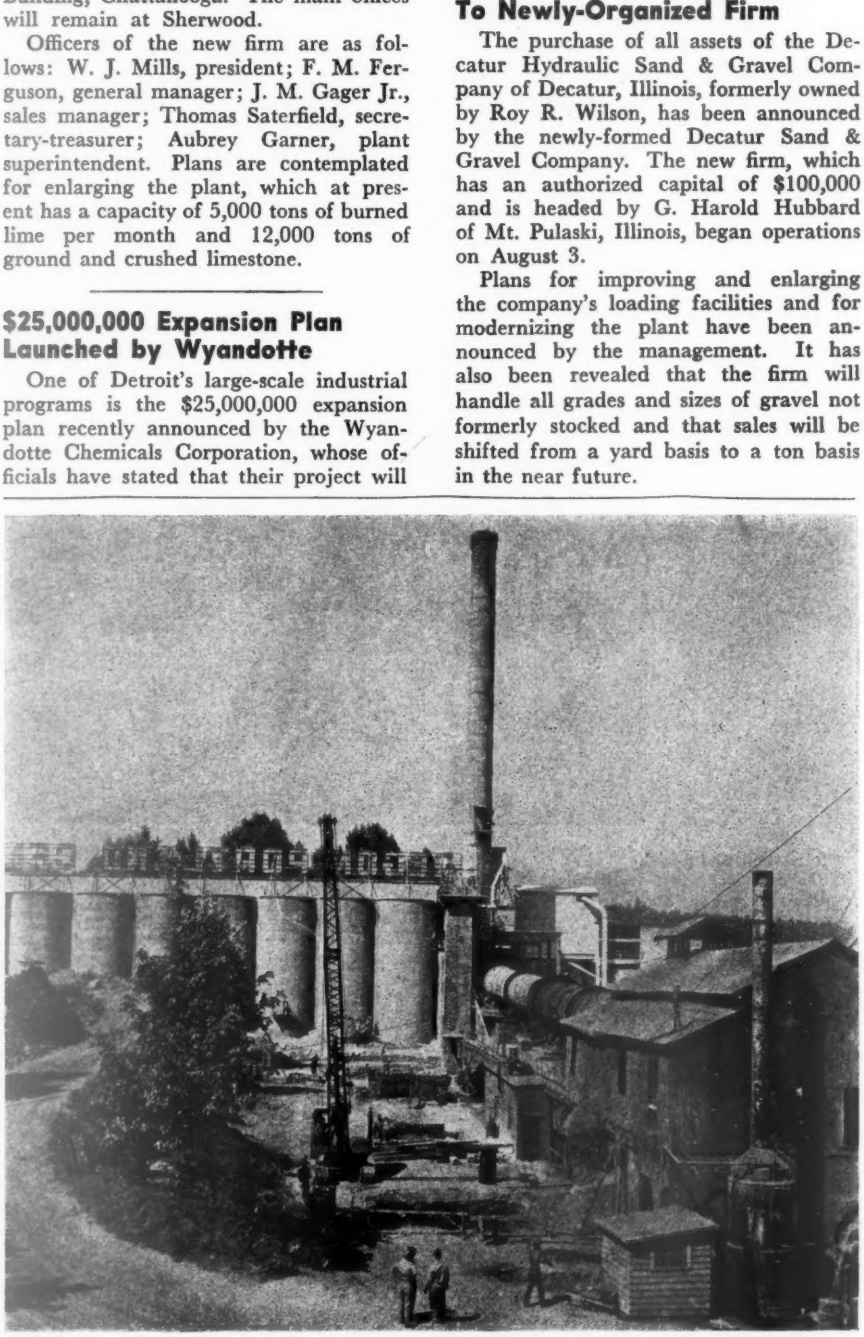
One of Detroit's large-scale industrial programs is the $25,000,000 expansion plan recently announced by the Wyandotte Chemicals Corporation, whose officials have stated that their project will be completed within 18 months. The addition of two new plants is expected to bring the total number of employees to more than 5,000.

Wyandotte Chemicals Corporation, formed in 1943 by a merger of the Michigan Alkali Company and the J. B. Ford Company, both of Detroit, is situated on a 1,500-acre tract containing salt deposits 200 feet thick. Its basic materials are salt, limestone, coal and water. At Alpena, Michigan, the firm operates its own big limestone quarries.

Illinois Producer Sells Out To Newly-Organized Firm

The purchase of all assets of the Decatur Hydraulic Sand & Gravel Company of Decatur, Illinois, formerly owned by Roy R. Wilson, has been announced by the newly-formed Decatur Sand & Gravel Company. The new firm, which has an authorized capital of $100,000 and is headed by G. Harold Hubbard of Mt. Pulaski, Illinois, began operations on August 3.

Plans for improving and enlarging the company's loading facilities and for modernizing the plant have been announced by the management. It has also been revealed that the firm will handle all grades and sizes of gravel not formerly stocked and that sales will be shifted from a yard basis to a ton basis in the near future.



• Excavating operations for the foundation of a second kiln at the Oswego, Oregon, plant of the Oregon Portland Cement Company. The new kiln will be parallel to the present one at the right, but will be 287 feet long, 77 feet longer than the one now in use. A Western Precipitation Cottrell electrical precipitator will be installed near the stack shown in the illustration. Upon completion of these improvements—about the middle of next year—production will be approximately 2½ times greater than at present. The F. L. Smidth Company is manufacturing the new kiln. (See Pit and Quarry, August, page 59.)

Historical California Firm Founded in 1853 Dissolved by Cowell

An industry with a record of nearly a century of continuous operation terminated its activities on September 1 at Santa Cruz, Calif. The Cowell Lime and Cement Company, successor to the original firm of Davis and Jordan, began dismantling its lime plant at Rincon, Calif., and its cement plant in Contra Costa County several months ago.

Albion P. Jordan, a native of Brunswick, Me., and Isaac E. Davis of West Boylston, Mass., both gold-seekers of the famed Forty-niners group, began burning lime in Santa Cruz in 1853. Their business prospered, and for several years lime was shipped by schooner in the company's own vessels.

In 1865 Henry Cowell, another New Englander, bought Mr. Jordan's interest in the business. He later acquired the interest of Mr. Davis, as well. His son assumed the operation of the firm upon his death in 1903 and still owns the extensive Cowell properties. The business has been managed in recent years by Frank George of Santa Cruz.

Next Road Show May Not Be Staged until 1948

J. T. Callaway, president of the Manufacturers Division of the American Road Builders Association, has announced that the first post-war Road Show may not be held until 1948. Mr. Callaway stated that strikes, government regulations and the allocation of large quantities of machinery to foreign governments have delayed the production and development of new machinery and equipment.

Government Competition Feared by Potash Industry

The spectacular growth of the potash industry during and since the war indicates a demand during 1946-47 which will call for 900,000 tons or more of the basic potassium oxide form, according to spokesmen of the trade.

Despite the outlook for continued expansion, however, the industry fears competition from the government, citing a bill, not yet passed by Congress, for an appropriation to establish a fertilizer plant at Mobile, Alabama, for the Tennessee Valley Authority. The T.V.A. is now producing triple superphosphate.

Nonmetallic-Mineral Producers

If you are not listed in the Directory Section of the next edition of Pit and Quarry Handbook it will be your fault if you do not send us listing information at once.

Morris-Knudsen Launches 15-Year Crushing Project At Granite Canyon, Wyo.

The Morrison-Knudsen Company, Inc., of Boise, Idaho, has moved approximately $1,000,000 worth of equipment to Granite Canyon, 22 miles west of Cheyenne, Wyoming, to produce ballast for the Union Pacific Rail Road. Giant steel girders are being erected to support the conveyor which will carry the granite rock from crushing plant to screening plant. Other equipment includes a $35,000 electric rock crusher and specially-built 20-ton trucks costing $13,500 each.

More than 100 men were on the payrolls on August 1, and the number is expected to increase according to F. E. Newell, project superintendent. Summer shipments were as high as 125 carloads daily, 55 tons of crushed rock to each car. There are 15,000,000,000 cubic yards of granite in the area of the plant, according to Dave Thompson, engineer who designed the entire plant.

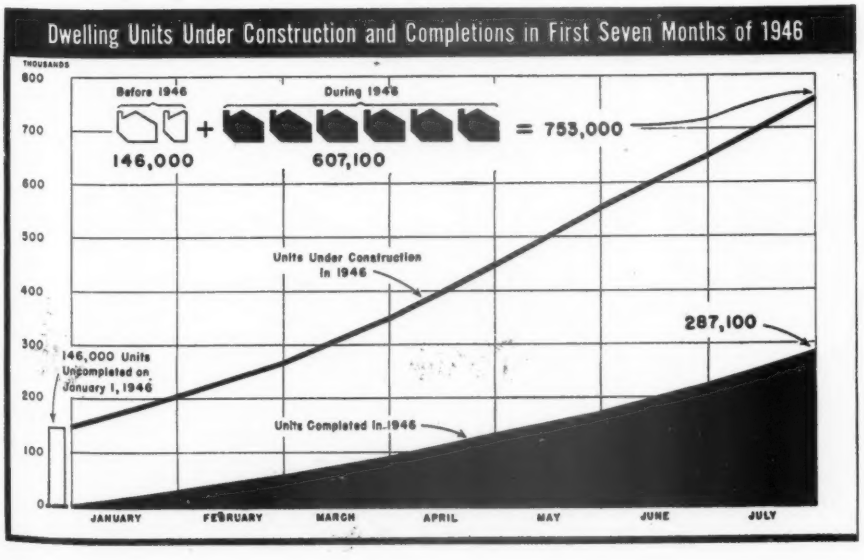
The project is being set up on a 15-year basis. Superintendent Newell explained that the "coyote" method of drilling and blasting is employed. After the hole is drilled, 40,000 pounds of dynamite is used to blast a single drilling.

Kentucky's Highway Plans Threatened by High Prices

Kentucky Highway Commissioner J. Stephen Watkins has disclosed that a slowdown in the state's road and bridge building program, which had been moving at a $2,000,000-a-month pace, is inevitable because of rising prices.

He also related that federal economy directives and the saturation point for road contractors' acceptance of new work would require a reduction in the state's road building and repair plans. To date, Kentucky has contracted for or advertised for bids on $15,335,000 worth of roads. About $10,000,000 worth of this work is scheduled to be done with federal aid.

• Below: A graph showing progress made in the construction of homes during the first seven months of 1946. The score: 287,000 units completed; 753,000 under construction
(The National Housing Agency, Office of the Housing Expediter)



Integrated Highway Plan Is Favorably Received

Thirty-nine states and the District of Columbia have accepted without reservation the integration by the Public Roads Administration of routes proposed by the states to form the national interstate highway system, Commissioner Thomas H. MacDonald has announced.

Development of a 40,000-mile interstate highway system was authorized by the Federal-Aid Highway Act of 1944, and the states were asked last year to recommend routes for inclusion in the system. The total length of routes selected by state highway departments was 45,074 miles, which included some duplicate mileage and more than 2,000 miles of circumferential and distributing routes in urban areas.

Marquette Wins First Place For 1945 Financial Report

Marquette Cement Manufacturing Company's annual report to its stockholders has been awarded first place among the cement industry reports, according to Weston Smith, vice-president of the magazine *Financial World* and director of the magazine's annual survey of stockholders' reports.

An "Oscar of Industry" signifying the selection was awarded at a banquet in the Grand Ballroom of The Waldorf-Astoria Hotel in New York on October 4.

In winning this award, the Marquette entry competed against the annual financial reports of 3,000 companies in 80 different industries.

Emsco Refractories Company of Vernon, California, recently sold its assets, including its trade name and good will, to Gladding-McBean & Company of Los Angeles and has withdrawn from the refractories business.

U. S. Producers Report Crushed Stone Production Down, Value Up in 1945

Crushed and broken stone sold or used by producers in the United States in 1945, as reported by the producers to the U. S. Bureau of Mines, totaled 152,346,520 short tons, valued at $161,459,264—a decrease of 2 percent in quantity, but a slight increase in value, as compared with that of 1944. The average value at the quarry increased 2 cents a ton. Included in this total is stone sold or used for concrete aggregates, railroad ballast, metallurgical use (flux), agricultural limestone, refractory stone, riprap, limestone sand, alkali works, calcium carbide works, sugar and glass factories, paper mills, and in various other chemical and manufacturing processes. Stone used in the manufacture of lime and cement, asphaltic stone, and slate used for granules and flour are not included in this total.

Fify-six percent of the crushed and broken stone was used for concrete aggregates and railroad ballast—85,373,260 short tons, valued at $80,429,619. Of the 64,108,190 short tons used for concrete aggregates, 93 percent was produced by commercial operators. These operators reported an increase of 4 percent in their production for this use, compared with 1944, whereas government agencies showed a drop of 40 percent in their production.

Metallurgical uses took 18 percent of the crushed and broken stone produced in 1945, but the 27,639,520 short tons, valued at $22,076,393, showed a decrease of 11 percent in quantity and 12 percent in value, as compared with the amount used in 1944. Limestone for agricultural purposes (17,395,570 short tons, valued at $25,892,317 — 11 percent of the total tonnage of crushed stone in 1945) also decreased in quantity—8 percent—but increased 2 percent in value. Although agricultural limestone sales were less than in 1944, they were higher than in any of the previous years. Refractory stone (2,526,650 short tons, valued at $4,545,339) showed an increase of 9 percent in quantity and 16 percent in value.

In 1945, limestone constituted 74 percent of all crushed and broken stone sold (excluding that used for making cement and lime), the same percentage as in 1944. Limestone is the most important of all stones used in crushed or broken form because it is regarded as an essential constituent of many products and necessary to the success of many chemical and manufacturing processes.

The Pit and Quarry Directory lists all the important nonmetallic minerals produced, both alphabetically and geographically. It is distributed free only to those listed in it. To all others the price is $15.00 per copy.

Sand and Gravel Output Shows Small Gains Over Last Year's Production

Production of sand and gravel increased less than 1 percent in 1945, according to figures released by the U. S. Bureau of Mines. Total output was 195,524,000 short tons, valued at $128,837,000, as compared with 194,783,000 tons, valued at $125,164,000 in 1944. Approximately 78 percent of the output was supplied by commercial plants and 22 percent by federal, state, county and municipal governments.

Sales by commercial producers in 1945 were 152,138,298 short tons, increasing 1 percent over the 150,633,081 tons produced in 1944. Most of the output of commercial plants is used in building, paving, and as railroad ballast; this tonnage increased 4 percent to 133,581,481 tons from 128,712,964 tons in 1944, due to the 16 percent increase in building sand, and an 8 percent increase in building gravel. The following sections indicate trends of industrial sands in 1945.

Sales of glass sand increased 5 percent to 4,681,920 tons, with an average value of $1.79 a ton. Leading producing states in the order named were Illinois, Pennsylvania, West Virginia, New Jersey, and Missouri.

Production of molding sand decreased 20 percent to 7,190,856 tons. The value averaged $1.35 per ton. New Jersey, Illinois, Michigan, Ohio, and Indiana were the leading producing states.

Sales of grinding and polishing sand decreased 28 percent to 642,511 tons, averaging $1.60 a ton. States leading in production were Michigan, Illinois, Pennsylvania, Missouri and California.

Decreasing 15 percent in tonnage, sales of fire or furnace sand were 308,997 tons, averaging $1.26 a ton. The largest output by states was from Indiana, Ohio, Illinois, Pennsylvania, and New Jersey.

Sales of engine sand declined 3 percent to 2,771,896 tons, averaging 69 cents a ton. West Virginia, Pennsylvania, Indiana, Illinois, and Nebraska led in production.

Production of filter sand decreased 25 percent to 109,845 tons. Average value was $2.10 per ton, an increase of 16 percent.

Washed, screened or otherwise prepared material comprised 85 percent (129,731,535 tons) of the total commercial production; average value was 77 cents a ton. The average value for unprepared sand and gravel was 46 cents a ton.

Of the total commercial output, 44 percent was shipped by truck, 49 percent by railroad, and 7 percent by waterway.

Long Rock Company to Open Princeville, Illinois, Plant

A newly-organized concern, the Long Rock Company, has announced that construction has been started on its plant near Princeville, Illinois. Members of the company are James Long, Gene Long and Merl Rock, with James Long acting as manager. Storage bins and other buildings are now being erected on the plant site. Equipment, including a jaw crusher, a roll crusher, a hammermill and a loading shovel, will be electrically operated to produce road rock, gravel and agricultural limestone.

Production is expected to begin in the immediate future, according to James Long, who also stated that the company anticipates serving Stark, Peoria, Fulton and Knox counties.

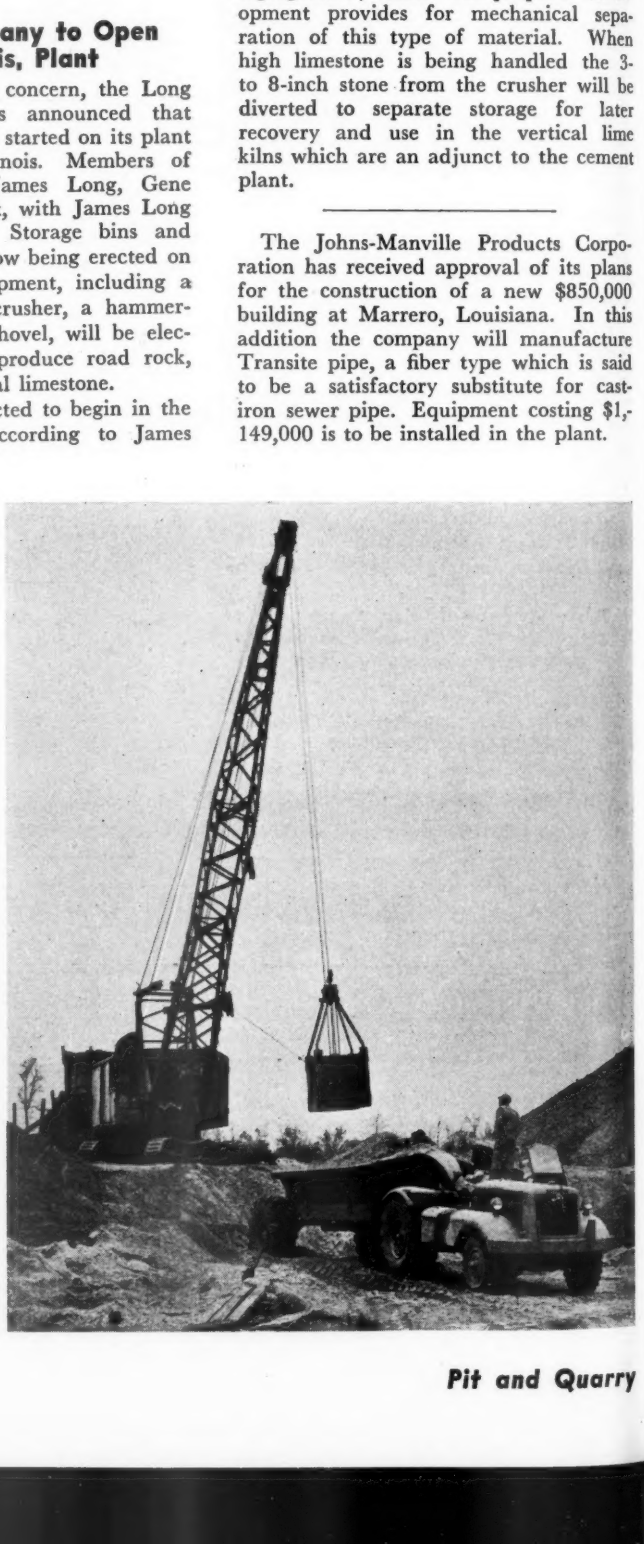
Lawrence Portland Cement Improvement Program Under Way at Maine Site

The quarry facilities at the Thomaston, Maine, plant of the Lawrence Portland Cement Company are being improved and expanded to provide for increased tonnages and mechanical separation of high calcium limestone. Increased capacity is to be accomplished by the addition of a new shovel and a fleet of diesel-powered trucks working on a series of low faces. The installation of a quarry terminal at the foot of the present tipple will provide a dumping station for the trucks and a loading point for hoist cars of increased capacity.

The nature of the rock formation in the Thomaston quarry is such that heretofore high calcium limestone has been segregated by hand. The proposed development provides for mechanical separation of this type of material. When high limestone is being handled the 3- to 8-inch stone from the crusher will be diverted to separate storage for later recovery and use in the vertical lime kilns which are an adjunct to the cement plant.

The Johns-Manville Products Corporation has received approval of its plans for the construction of a new $850,000 building at Marrero, Louisiana. In this addition the company will manufacture Transite pipe, a fiber type which is said to be a satisfactory substitute for cast-iron sewer pipe. Equipment costing $1,149,000 is to be installed in the plant.

• Below: Caterpillar diesel, DW10, wheel-type tractor pulling a Caterpillar W10 wagon as it hauls gravel from processing plant to railway siding near Minden, La. Four trips per hour are made over a 1½-mile haul with 11-cu.-yd. loads. • Right: Dragline, powered by a Caterpillar D17,000 diesel engine, is used to load a W10 wagon.



Rutgers Research Bureau Announces Discovery of Valuable Lime Sand Beds

A new source of easily-mined lime for the important agricultural areas of southern New Jersey has been found in a highly valuable deposit of lime sand discovered near Vincentown by the Bureau of Mineral Research at Rutgers University, the State University of New Jersey. This information was revealed in a recent report released by G. H. Holsten, Jr., of the Rutgers News Service.

Bureau scientists have announced that 50 acres underlain by a 9-foot strata of relatively pure lime sand, with an overburden averaging 7 feet, have been located on the north bank of the Rancocas Creek near Vincentown in Burlington County. It is estimated that the strata contains some 700,000 tons of lime sand.

The study, one of several being conducted by the bureau to uncover new and valuable mineral deposits in New Jersey or to find new uses for known mineral resources was carried on under the direction of Dr. Alfred K. Snelgrove, former head and organizer of the Bureau, and Dr. Henri Bader, a Rutgers geologist. Dr. Helgi Johnson, head of the Rutgers Department of Geology and Geography is now acting head of the bureau.

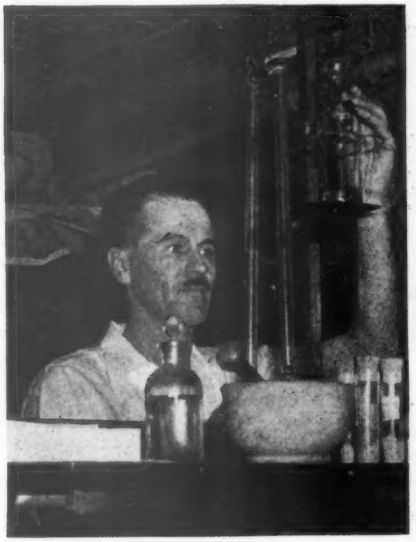
In the bureau's report, it is pointed out that New Jersey is currently using nearly 200,000 tons of lime yearly for agricultural purposes, principally in the form of ground limestone. Despite the large deposits of limestone and efficient limestone quarries in northern New Jersey, the state is importing nearly half of its agricultural limestone, primarily because the consuming centers of the southern part of the state are located nearer Pennsylvania sources than to those in northern New Jersey.

According to Dr. F. E. Bear of the New Jersey Agricultural Experiment Station at Rutgers, approximately 680,000 tons of lime are needed to bring New Jersey soils up to the best condition for plant growth. He estimates that another 248,000 tons will be needed annually thereafter.

The study of agriculturally-important mineral resources was one of the first projects undertaken by the Bureau of Mineral Research upon its establishment in June, 1945. After compiling all available information on limestone deposits in the northern part of the state, the bureau organized a search for raw lime materials in the Coastal Plain, which extends south of a line between Trenton and New Brunswick.

Green sand and shell marl deposits have been found there and used before the introduction of commercial fertilizers, but the bureau soon by-passed these low-grade deposits and concentrated on the rarer lime sand which had long been known to exist in the Vincentown area through the work of the State Geological Survey.

Available geological reports showed lime sand to be exposed or recognized in wells as far north as Wrightstown. Lime sand is reported to be 31 feet thick in parts of Burlington County, and Atlantic City wells have cut through 450 feet of this material. In these places, however,



Dr. Henri Bader

the overburden was found to be far too great to permit economical mining.

"The problem resolved itself into finding sufficient thickness of lime sand with slight overburden," Dr. Bader added. "Approaching the problem from the economic viewpoint, the Bureau's field men drilled some 80 holes to determine the thickness of the soil and sand which overlay the lime sand as well as the thickness of the mineable portion of the lime sand itself. It was soon evident that only the upper part of the lime sand was sufficiently pure to be able to compete with ground limestone from elsewhere. The drilling has shown that 50 acres are underlain by a thickness of 9 feet of relatively pure lime sand with an overburden averaging 7 feet. This deposit contains some 700,000 tons of lime sand.

"The grade of lime sand is approximately 73 per cent. lime carbonate," Dr. Bader continued. "This compares with 85-98 per cent. in the limestone marketed by northern New Jersey and Pennsylvania producers.

". . . The Vincentown lime sand can be produced without blasting and requires little if any crushing or screening. The lime sand is made up of broken fossil shells and coral-like forms. These fragments are quite porous and consequently the sand may well prove to be usable in larger grain sizes than ordinary crushed limestone.

"To insure proper use of this resource the Bureau of Mineral Research is recommending to the land owners that leases to operators be on a royalty basis, that a development clause be included and that provision be made for replacing the valuable topsoil after the underlying lime sand is extracted," Dr. Bader concluded.

The bureau has announced that it is continuing its survey for additional economic lime sand deposits in the area around and southwest of Vincentown.

La Tolteca Cement Co. Building Complete Plant Of 750-Ton Daily Capacity

Plans for the addition of a completely new plant by La Tolteca, Compania de Cemento Portland, S.A., Tolteca, Hidalgo, Mexico, have been announced by Luis Elek, general superintendent, who recently returned to Mexico after an extended business trip to England and the United States. The new facilities will be located adjacent to the present plant.

Complete mechanization of the limestone quarry will be accomplished with two Bucyrus-Erie 6-inch well drills and one 2½-cubic-foot Bucyrus-Erie electric shovel. The 36-inch-minus limestone will be carried to the primary crusher, about 150 yards from the quarry, in 15-ton side-dump trucks. The primary crusher is an Allis-Chalmers 42-inch Superior McCully gyratory type, which will reduce the stone to 6 inches. This material will then be taken by belt conveyor to two 4½-foot Symons cone crushers, which will crush it to 1½ inches. Another belt conveyor will carry it to a hopper. From this point 15-ton side-dump trucks, identical with those mentioned above, will transport the stone to the plant, about three miles distant.

Further crushing by two 4-foot Symons short-head cone crushers will result in ½-inch material, taken by a belt conveyor to the mill hopper or to storage.

The clay will be washed by a 16-foot-diameter wash mill in the clay quarry and pumped by Newell slurry pumps to the clay mixing tank, from which it will be fed by gravity to the tube mill.

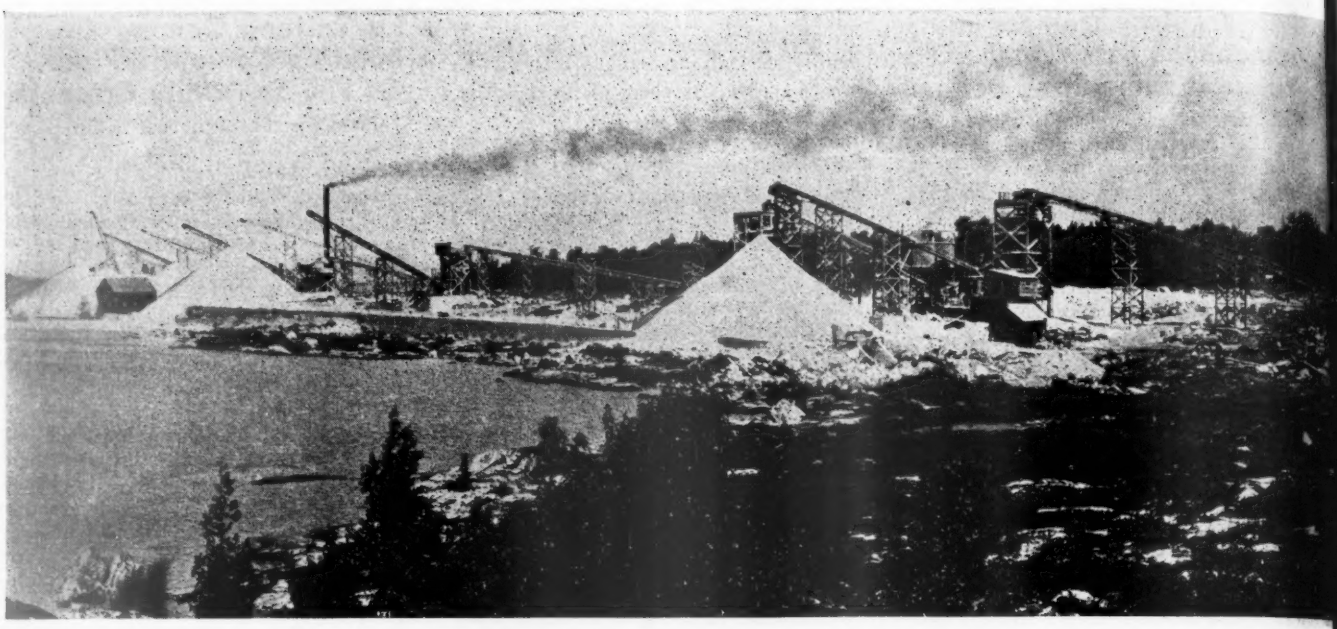
The stone is to be fed by 24-inch Merrick Weightometers to the two Newell 7¼- by 40-foot compartment mills, which are driven by 800-hp. Metropolitan Vickers synchronous motors. Slurry will be pumped to three tanks for correction, and will flow from there by gravity into two slurry mixers 66 feet in diameter. From the mixers it will be pumped to the kiln feeders. All pumps are of the piston type, made by Newell.

Two new Vickers-Armstrong kilns 350 feet long and 11 feet 6 inches and 10 feet 2 inches in diameter, with enlarged calcining zones and chain systems at the feed end, will be installed.

The clinker will be discharged into two 6- by 29-foot Fuller coolers and carried by belt conveyors to the mill hopper or the main storage. The latter is served by a 7½-ton overhead electric crane.

Two Newell finish mills, identical with the wet raw mills, will be used; they will also be powered by 800-hp. Metropolitan Vickers synchronous motors. A 24-inch inclined belt conveyor will carry the cement to the present cement silos; packing will be done by two Taylor four-tube bagging machines.

In anticipation of future expansion, the plant has been designed so that its capacity can be doubled by the installation of two more kilns and four additional mills. All conveying equipment is adequate for the final capacity—about 750 tons per day. Officials expect to begin producing cement at the new plant about the end of 1947.



• A general view of the Drummond Dolomite plant from the primary crusher (extreme right) to stockpiles of finished material (left).

Big Dolomite Plant Built on Lake Island From Dismantled Wisconsin Facilities

another ON THE SPOT report

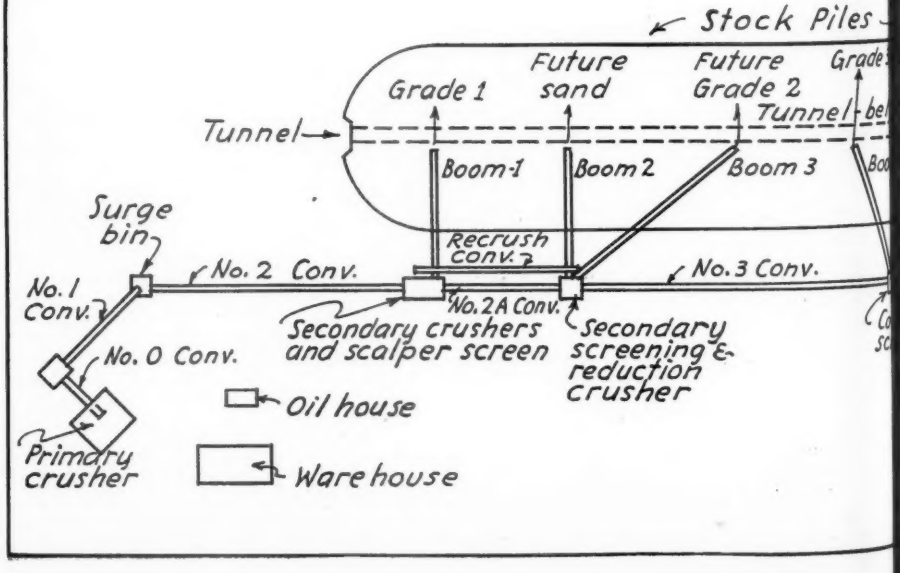
By WALTER E. TRAUFFER

MANY portable and temporary aggregates plants are moved from place to place as material and market demands require and even some of the smaller stationary operations are sometimes moved. Seldom, however, is a really large plant, like that of the Sturgeon Bay Co., torn down and reassembled at a new location. This 1½ million-ton per year plant, which had been developed at Sturgeon Bay, Wisconsin, over a period of nearly 30 years, was dismantled late in 1944 and, with substantially the same equipment, was rebuilt on Drummond Island, Michigan, going back into operation in November, 1945, a week before the lake shipping season ended. Operation was resumed on April 15, 1946. Its capacity now is about one million tons annually operating two 8-hour shifts from 8 to 8½ months per year. This is the first large new lake plant to be built in many years and it is now operated by Drummond Dolomite Incorporated.

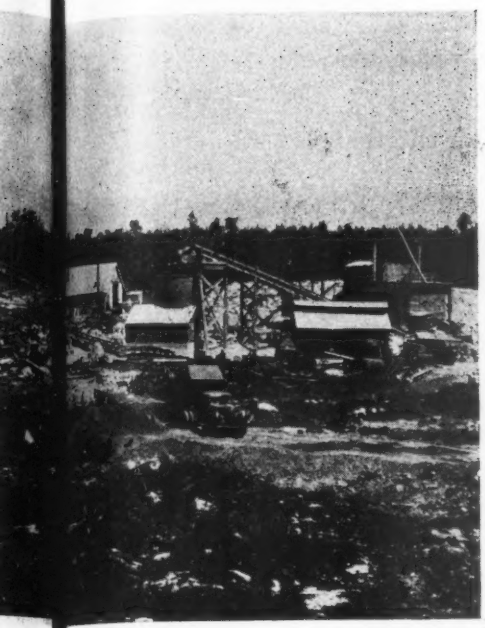
From Sturgeon Bay construction and metallurgical stone was shipped by boat to ports on all the Great Lakes. The new location is, however, closer to the most important markets and the stone, having a higher chemical purity, has wider application. It is suitable for alkali and magnesium manufacture, for concrete aggregate, and has a high enough calcium content for many other purposes. It is said to be the only deposit of Engadine dolomite being worked commercially in this country.

The plant and quarry are located on the extreme western end of Drummond Island, a 28- by 8-mile wilderness inhabited by deer, bear, Indians and a few resorters, hunters and fishermen. They are one mile directly across the St. Mary's River from the town of DeTour which is on the extreme eastern tip of the Upper Peninsula of Michigan 60 miles southeast of Sault Ste. Marie, the nearest railroad point. This river is actually a channel between Lake Huron and Lake Superior which all ore boats follow to and from the latter lake.

The quarry had been used in the past for breakwater stone and was



• Plan drawing showing layout of Drummond Dolomite plant.



partly developed and stripped. The quarry floor is 5 feet above the lake level and the face now consists of three 10-foot ledges. As the quarry is developed back from the shore additional ledges above these will form an eventual 55-foot face. The overburden averages 4 feet in depth and considerable timber must be removed.

Most of the drilling is done with three Loomis Clipper and two Sanderson Cyclone 6-inch well drills. Holes are drilled in a single row on 12- to 14-foot centers with a 16-foot burden. All holes are loaded with 40 percent gelatin with stemming at the seams. Primacord is used for detonation. At lower sections of the face drilling is done with two Ingersoll-Rand X71 wagon drills for which air is supplied by two Ingersoll-Rand diesel-driven portable compressors. Jackhammers are used for secondary drilling.

The stone is loaded by a Bucyrus-Erie 120B electric shovel with a 4-cu. yd. dipper. A Caterpillar tractor with a LeTourneau bulldozer cleans up after the shovel. The stone is hauled to the primary crusher, an average distance of about 700 feet, by two 10-cu. yd. Euclid trucks and three 10-cu. yd. Autocar trucks equipped with Cummins diesel engines.

The 42-inch Allis-Chalmers Superior McCully gyratory primary crusher reduces the stone to minus-6-inch size. A Chisholm-Moore electric hoist suspended from an I-beam operates the stone hook. Conveyor No. 0 (50-inch by 40-foot) and conveyor No. 1 (50-inch by 130-foot) carry the stone to a 200-ton surge bin. Under this is a Stephens-Adamson apron feeder which discharges the stone on conveyor No. 2 (40-inch by 250-foot) to the secondary crusher building. There a Telsmith 6- by 10-foot vibrating screen with 4- and 2-inch openings can scalp the stone off either or both decks to either or both of two crushers. Usually the 4- to 6-inch stone goes to a 7-foot Symons cone crusher and the 2- to 4-inch stone goes to a 10-inch Allis-Chalmers Superior McCully crusher.

The products of the two crushers and the material through the bottom deck of the screen are carried together on conveyor No. 2A (50-inch by 160-foot) to the secondary screening building where all sizes are removed which do not require washing. The stone is split to two Telsmith 5- by 12-foot 2-deck screens with screen openings changeable as needed. When visited the demand called for 1-inch-minus and 1½-inch-plus stone. The 1- to 1½-inch stone off the bottom decks of the screens was discharged into two Symons short-head cone crushers, one 4-foot and one 5½-foot, and thence on the 36-inch by 137-foot return conveyor back to a bin at the secondary crushing building. A Jeffrey pan feeder discharges this stone back on conveyor No. 2A.

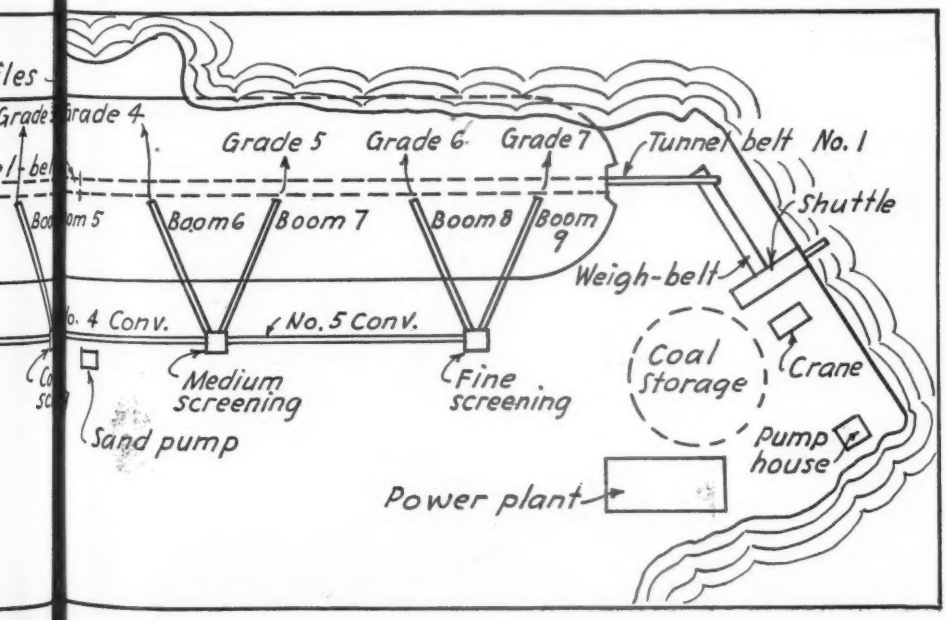
Boom belt conveyors No. 1, 2 and 3 at the secondary screening building have not yet been installed so the two sizes of stone produced there are temporarily recombined on conveyor No. 3 (36-inch by 330-foot) to the coarse-screening building. There hoppers feed to a pair of Stephens-Adamson 3- by 6-foot 3-deck screens equipped with washing sprays. At that time the 1¼- to 1¾-inch and 1- to 1¼-inch products off these decks were discharged on 24-inch by 153-foot boom belt conveyors No. 4 and 5, respectively, which discharged them to nine concrete-walled individual sections over the 1200-foot long stortage tunnel parallel to the plant. This stockpile has a total capacity of about 100,000 tons, of which about one-half is live, but only six of the nine sections are now being used.

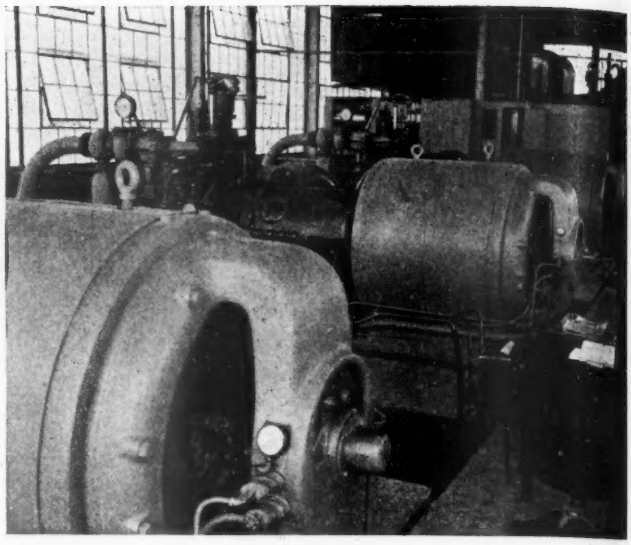
The minus-1-inch stone through the bottom decks of these screens is carried on conveyor No. 4 (30-inch by 257-foot) to the intermediate screening building. There it is discharged from hoppers on three Nordberg Symons 4- by 12-foot spray-equipped 2-deck screens. The ¾- to 1-inch and ½- to ¾-inch products are carried on boom belt conveyors No. 6 and 7 to storage. These conveyors are both 153 feet long, and 24 and 18 inches wide, respectively.

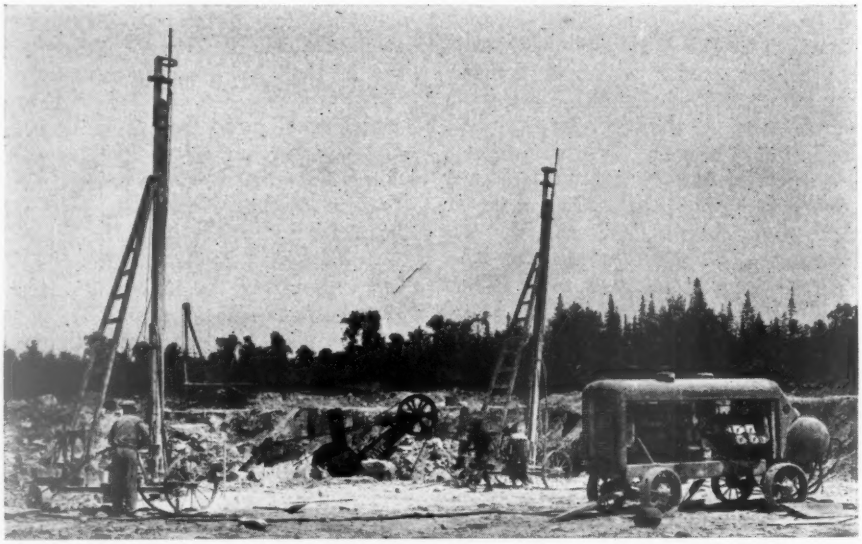
The minus-½-inch undersize from these screens is carried on conveyor No. 5 (24-inch by 270-foot) to the final screening building. There hoppers feed to three Symons 4- by 12-foot 2-deck screens equipped with sprays. Their ¼- to ½-inch and 8-mesh ¼-inch products are carried to storage on 18-inch by 153-foot boom conveyors No. 8 and 9 respectively.

The minus-8-mesh material through the bottom decks of these screens will be flumed to a sand drag to be installed. At present it is pumped into a pile at the location of future boom conveyor No. 2 which will store it.

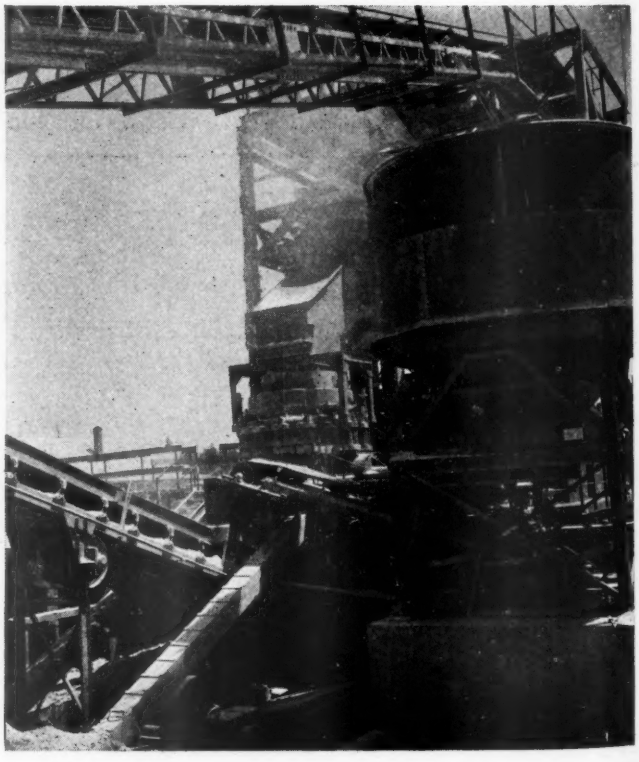
The reinforced-concrete reclaiming tunnel over which the various products are stored is 6½ feet high and 8 feet wide inside and 1200 feet long. This tunnel is in two sec-

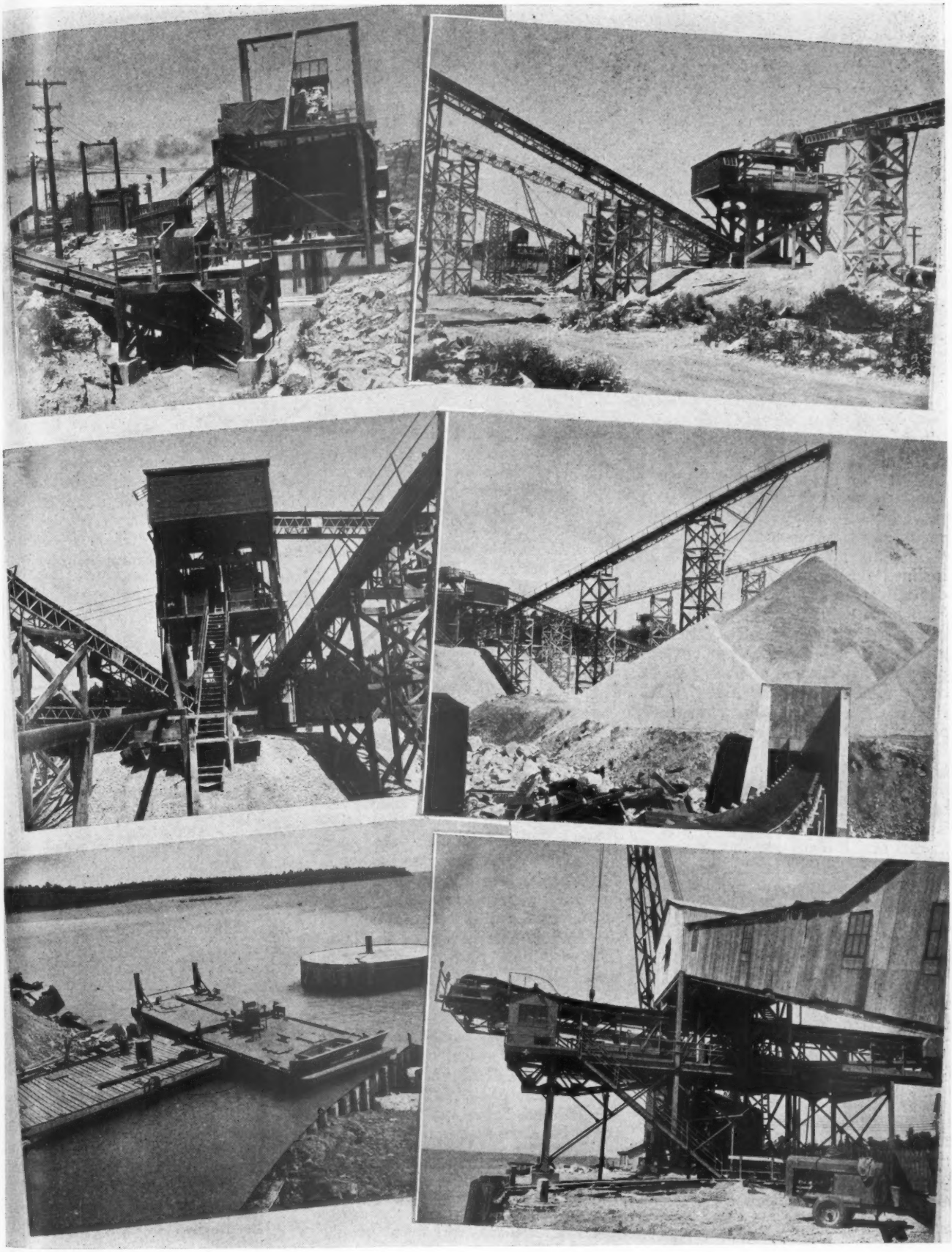




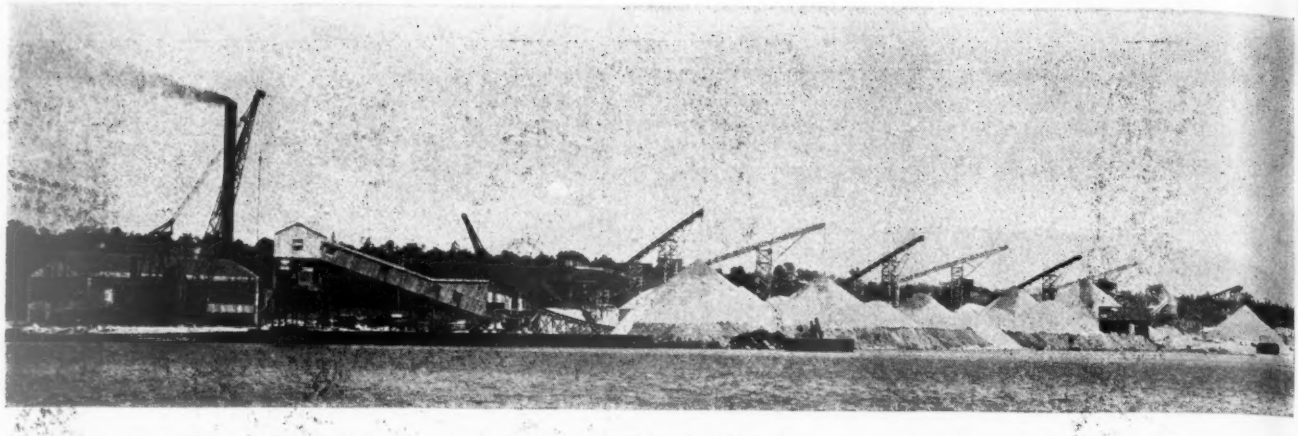


- Left above: A shovel loading one of the five 10-cu.-yd. trucks in the quarry.
- Right above: The three 625-kv.a. turbo-generators which provide all power.
- Left: The two wagon drills and a portable compressor at work in the quarry.
- Left, below: The conveyor weigher which records the amount of material loaded into the boats.
- Right, below: The secondary crushing and scalping station with a cone crusher at the left.





• Top, left: A truck dumping a load into the primary crusher. Right: General view showing screening stations and stockpiling conveyors.
• Center, left: One of the three screening stations. Right: Two of the stockpiling conveyors and the discharge end of the reclaiming tunnel.
• Bottom, left: A part of the dock and the "Sea Mule" used as a tugboat. Right: The shuttle belt conveyor at boat-loading dock.



• A general view of the plant from the water. The power house and the boat-loading dock are at the left.

tions, the one at the quarry end (No. 2) being at a 6-foot higher level than No. 1 to provide for discharge from one belt onto the other. The No. 2 reclaiming belt conveyor is on 612-foot centers and No. 1 is 693 feet long. Both have Chain Belt idlers and pulleys. There are 186 discharge openings in the top of the tunnel and each is provided with an undercut gate calibrated so that various sizes of material can be blended accurately onto the conveyors.

The No. 1 reclaiming conveyor is inclined outside the tunnel to discharge on a 60-inch by 96-foot Stephens-Adamson belt conveyor equipped with Merrick Weightometers which record the amount of material loaded into a boat. This conveyor discharges the material at the boat-loading station onto the 60-inch by 82-foot Stephens-Adamson shuttle belt conveyor which can be extended far enough to load a boat with a 60-foot beam. This system has a maximum loading capacity of 2,000 t.p.h. The first vessel loaded at the plant was the Steamer "Sumatra" which took on a cargo of 6,189 tons in an actual loading time of six hours and ten minutes, or a total loading time of eight hours, an amazing speed for the first attempt.

The dock to which boats are moored for loading is unique. Its main section is the old steamship "Ogleby" which was sunk and filled with rock. At each end are 30-foot-diameter circular and rectangular cells which are also filled with rock and capped with concrete.

The plant is a stright-line operation 1500 feet long overall. Due to war shortages it was built almost entirely of wood except for the steel conveyor frames. Allis-Chalmers electric motors are used almost exclusively and automatic sequence starting and stopping is used. Conveyor No. 2A is driven through dual pulleys from a Stephens-Adamson tandem gear drive and a Jones speed reducer. All the other main conveyors are driven through Jones reducers and the boom conveyors through Link-Belt silent chains.

As there was no power plant on the island the company had to provide one—so it bought from the Government an 1875-k.v.a steam plant. Briefly, this consists of three 625-kv.a. General Electric surface-condensing turbines. The 2300-v. current generated is reduced to 440 v. at six substations for all motors except those in the reclaiming tunnel. The steam is produced by three 330-hp. Heine water-tube boilers with Detroit Rotostokers. This plant has a 30 percent reserve of power over the amount required by the 2100 hp. of electric motors installed. The factor is about 60 percent and the power factor about 75 percent. The power plant is almost completely automatic. In addition to the other usual control equipment the main control board has separate ammeters for the various major equipment units and departments.

Water for all purposes except drinking is obtained from the lake. Three 8-inch pumps supply the needs of the power plant and a 10-inch and an 8-inch pump supply wash water for the stone plant.

Stone is shipped in self-unloading boats from several of the lake fleets including the Reiss Steamship Co., the Tomlinson Steamship Co., and the Boland-Cornelius Co. These boats have capacities up to 13,000 tons.

A crew of 60 men is required for the two shifts and most of these live on the mainland. Except for a few key men they are local people new to the crushed stone business and had to be trained from scratch. Boats are provided to carry them across the river. A Chrysler "Sea Mule" tugboat designed for war service hauls passengers and heavy freight. It has two 140-hp. gasoline engines and a capacity of 400 tons. It is also used to tow barges.

The main office of the Drummond Dolomite Co. has been located since late in 1945 in the Reiss Bldg., Sheboygan, Wis. Officers of the company are: W. A. Reiss, president; Warren C. Jones, vice-president; C. G. Knoblock, vice-president and general manager; W. A. Reiss Jr., vice-president and treasurer; W. W. Newcomet, vice-president and secretary; A. J. Risatti, assistant secretary and treasurer; Wm. Carper is general foreman and John Kralapp is power plant superintendent.

Mr. Knoblock made the original rough layout of this plant and had much to do with getting it built and in operation. He first started in the crushed stone business in 1924 as an engineer with the National Lime & Stone Co. at Findlay, O. He rose to chief engineer and general superintendent before joining the Sturgeon Bay Co. in 1936 as vice-president and general manager.

The main plant office is located at DeTour and is equipped with a ship-to-shore radio to provide communication with the boats. There is also a telephone system connecting the plant and warehouse on the island with the DeTour office.

In an attempt to alleviate an acute stone shortage threatening Kentucky's road construction and maintenance programs, that state has leased quarry property in Owsley and Carter counties.

The department's participation in the stone business is not considered competition with private enterprise, it was explained, because quarries are now working at capacity production, but still are unable to supply state needs.

The Davison Chemical Corporation, of Baltimore, Md., has announced the acquisition of the Florida Phosphate Rock Mining Properties of the Southern Phosphate Corporation. These properties will be operated as the Phosphate Rock Division of the Davison Chemical Corporation, Bartow, Florida.

Practical Suggestions for the Proper Care of Wire Rope

By CHARLES BLAIR
The Upson-Walton Co.,
Cleveland, O.

another P-Q exclusive

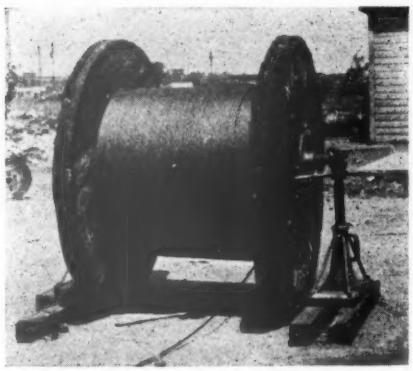
WIRE ROPE does not deteriorate with age so much as with use. It is important, then, that proper care be taken in the handling of wire rope, for the life of the rope is directly proportionate to the care it receives.

The time to show proper care for rope is when it is first placed in use. There is a wrong and a right way to uncoil a piece of rope, a wrong and right way to remove rope from a reel. To uncoil a wire rope, roll along the ground or floor as one would roll a hoop. It should never be laid flat, for spirals are likely to obtain which in turn might create loops and then kinks. When kinks are formed a danger spot is created, the wires at the point of kinking having taken a permanent set. When the rope is then placed in use these weakened wires may break very early in service. To remove a rope from a reel, mount the reel on a shaft, resting on jacks or other types of supports available; this permits the rope to run off straight ahead. Figures 1 and 2 show the correct methods of uncoiling and unreeling wire rope.

When a new rope is reeved over

• Fig. 1. Uncoiling wire rope.

a series of sheaves, it is important that these sheaves be in alignment—that is, the axis of the rope should coincide with the centerline of the sheave grooves. If this proper alignment does not obtain the rope will constantly rub along the flanges of the sheaves, wearing not only the outer wires of the rope, but also wearing the flanges of the sheaves to knife-like edges which eventually grow jagged. This condition acts like a saw on the wires, greatly shortening the life of the rope. It is impossible, of course, not to have

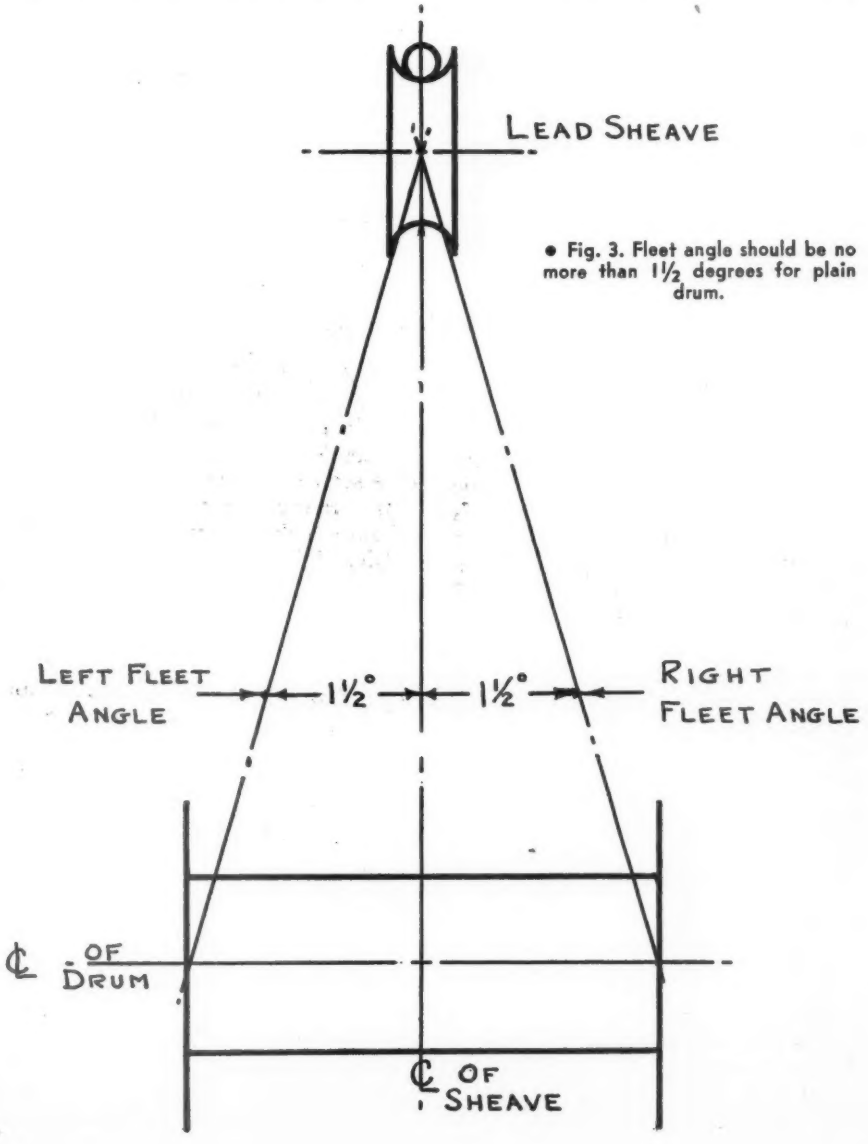


• Fig. 2. Reel supported on jacks to permit rope to run off straight ahead.

an angle of deviation when employing a drum. This angle, called the fleet angle, should be no more than 1½ degrees left and right, from the lead sheave. (See Fig. 3). If the drum is grooved the fleet angle may extend to 2 degrees.

Before a rope is placed in service all sheaves and drums should be inspected. A sheave with a rope imprint worn in the groove causes excessive abrasion. Broken flanges with ragged edges saw on the rope working on a fleet angle, causing premature breaking of the outer wires of the rope. Rigging on equipment should be arranged, wherever possible, to avoid reverse bends. Reverse bends fatigue the rope unduly.

The commercial designations of grades of steel used in rope wire are as follows: Iron, Mild Plow Steel, Plow Steel, and Improved Plow



• Fig. 3. Fleet angle should be no more than 1½ degrees for plain drum.

Steel. When loads are light and small-diameter sheaves are employed, ropes composed of low-carbon steel wires prove more satisfactory than ropes of high-carbon steel wires because they are more flexible and more resistant to bending fatigue. Cast-iron sheaves are proper in these applications. On the other hand, ropes laid-up from high-carbon steel wires (Mild Plow, Plow, and Improved Plow Steel), ropes designed for heavy loads, require cast steel sheaves. They will resist to a greater degree and for a longer period the expected wear upon the grooves and result in longer life for both the sheaves and rope. It is essential, when new rope is installed on old equipment, that sheave grooves are not so small that they will pinch the rope. The following table gives the minimum tolerance of groove diameters:

Rope Diameter	Minimum Groove Diam. Tolerance
¼—5/16"	Plus 1/64"
3/8—¾"	Plus 1/32"
13/16—1⅛	Plus 3/64"
1 3/16—1½"	Plus 1/16"
1 5/16—2¼"	Plus 3/32"
2 1/16" and larger	Plus ⅛"

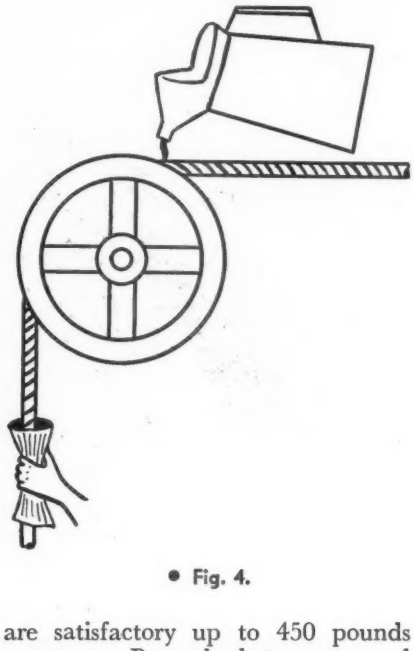
When it is possible, avoid winding more than one lap on drums as this has a tendency to crush the rope and force the strands out of position; it cuts the fibre core and allows the strands to move out of position so that eventually only part of the strands are doing the work. Excessive strain results and early breakdown of the rope is assured. Obviously, this condition cannot always be avoided, in which case it might pay to consider using a rope with an independent wire rope center.

It is important to use the proper diameters of sheaves. A 6 X 7 rope (six strands of seven wires each) is much stiffer than a 6 X 19 rope; a 6 X 19 rope is much stiffer than a 6/37 rope. Consequently, the 6/37 rope, to work efficiently and to last its expected lifetime, needs sheaves of considerably greater diameter than the 6/19 rope; the 6/19 rope should have sheaves of greater diameter than the 6/37 and 6/42 ropes. Following is a table of minimum and recommended diameters:

Rope Construction	Tread Diameter Minimum	Recommended
6 X 7	42 X D	72 X D
6 X 19*	34 X D	51 X D
6 X 19†	30 X D	45 X D
8 X 19§	21 X D	31 X D
6 X 37	18 X D	27 X D

*Seale.
§Filler and Seale.
†Filler.
(D equals nominal rope diameter.)

Pressure is another factor which determines the diameter and composition of sheaves. Pressure varies directly with tension and inversely with the radius of the sheave and diameter of rope. Cast iron sheaves



• Fig. 4.

are satisfactory up to 450 pounds pressure. Beyond that, cast steel sheaves are required for longer life to both sheaves and rope.

Lubrication is an important factor in the life of a rope. A rope must be considered a machine of many moving parts. Normally a rope contains from 42 to 252 wires, all of which flex while the rope is in operation. Like a car, or any other piece of machinery with moving parts, a wire rope is lubricated when it is fabricated. Like a car, it wants relubrication. If a rope continues to be used after the initial lubricant has worn off, the abrasion factor is high and the outside wires are soon worn through, leaving very little reserve strength in the rope. Figure 4 shows one method of applying lubrication to a rope while it is in operation. Regular dates should be established to do this very important chore.

Wire rope catalogues give ultimate tensile strengths of the various sizes of ropes, suggesting therein that the user establish a working load of not greater than one-fifth the breaking strength. A ⅝-in.-diameter rope, 6/19 construction, Improved Plow Steel, has an ultimate tensile strength of 31,800 pounds. Too many operators ignore the suggestion of a 5/1 safety factor, thinking that 15,000 pounds or more is not too great a load. They don't stop to think that by refusing to consider the recommended factor of safety they are loading the rope too close to the elastic limit, or that this load will cause the fibre core to break down. Fibre in the core will be cut and, if independent wire rope center, wires will be severely nicked, in either case resulting in a breakdown of the foundation of the rope and loss of support to the strands. The clearance between the strands is lost, causing them to bind in the interstices with a consequent breaking of the wires. It is far more economical to choose a size and grade of rope which is designed for a working load of 15,000 pounds in that it will outlast out of proportion to its additional cost the rope which has been asked to exceed its proper working load. The 5/1 safety factor should be the minimum. Where life and limb are at stake, factors as high as 12/1 obtain. Many states now have laws governing elevators which transport people. New York State, for instance, has established safety factors from 7½ to 1 to 13¾ to 1 contingent upon the feet per minute speed of the elevators.

Many states now require periodic inspection of ropes when they are used on equipment which transports people. This, whether required by law or not, is a noteworthy plan. If a schedule for lubrication is established, it would be well to inspect at these intervals. Look for wire breaks, and for severe abrasion which will shortly result in breaks. Inspect the parts over which the rope is forced to run. Replace worn sheaves; it is more economical in the long run. If a rope is subject to suddenly-applied loads, special attention should be given the load end. Cutting off three or four feet of the end at regular intervals is good practice, because this end, regardless of the proper application, takes a strain beyond the weight of the load, weakening the rope excessively at that point. Particular attention should be given fittings. Sockets, when properly applied, obtain 100 percent efficiency. However, rapid hoisting sets up vibration in a rope which concentrates at the point directly above the socket; therefore, it is sound procedure to cut off a length of rope from five to 20 feet long at the socket end roughly every third of the estimated life of the rope. Thimble splices average 85 percent efficient, greater for smaller ropes, less for larger diameter ropes. Clips average 80 percent efficient. You might say, in the case of thimble splices, that 85 percent of the time they will last the life of the rope and 15 percent of the time they will fail. Normally splices and clips will serve and fail only gradually. It is best, however, to anticipate the

(*Continued on page* 82)

Modernizing Power System Doubles Sand and Gravel Output

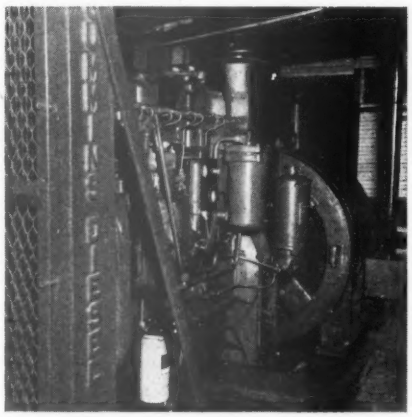
By WILLIAM M. AVERY

another P-Q exclusive

THE Ohio Mineral Company, located at Beaver, Ohio, about 12 miles east of Jackson, has recently doubled its output of silica sand and gravel without adding a single unit of primary productive equipment to its plant facilities. The remarkable step-up of shipments from four to eight carloads per 9-hour day was accomplished by the elimination of the frequent production delays encountered in the attempt to operate a considerable number of small, over-age gasoline engines for driving conveyors, screens and other equipment throughout the plant and in the pit.

Admittedly, the engines were in bad shape. Magnetos were faulty, and insulation was in such poor condition that even a light fog was likely to stall the units. After heavy rains (and any rainfall in the Ohio Valley area is likely to be heavy) it required many hours of exasperating work to get all the engines back in operation. And since there were no stand-by power units, *all* the engines had to run before the plant could resume production.

At the plant proper, where the washing and screening operations are carried on, these troubles were eliminated by the relatively simple expedient of replacing six small gasoline engines with electric motors, using power furnished by a new 120-hp. Cummins Model HBS diesel engine. The engine, which is direct-connected to a Burke alternating-current generator, is at present about 60 percent loaded, leaving a generous margin for a future increase in the capacity of the plant.



• This 120-hp. diesel engine, direct-connected to an a.-c. generator, enabled the Ohio Mineral Company of Beaver, O., to replace six small, over-age gasoline engines with electric motors. The resulting elimination of frequent breakdowns doubled production at the washing plant.

It was as simple as that. From four carloads per day, with a lot of hard, profitless work, to eight carloads with considerably less work and incalculably less wear and tear on the personnel's nervous systems.

At the pit, which is located about 8½ miles from the washing plant, a somewhat different (although related) problem was presented. Five sections of field conveyor, 18 inches wide and ranging from 40 to 90 feet in length, had been used for feeding pit-run material from the bank to a scalping screen set up over bins for loading trucks. The tail conveyor was loaded with an Insley ⅝-cu.-yd. gasoline shovel, and since the shovel progressed through the bank quite rapidly, it was necessary to shift conveyors on an average of once each working day.

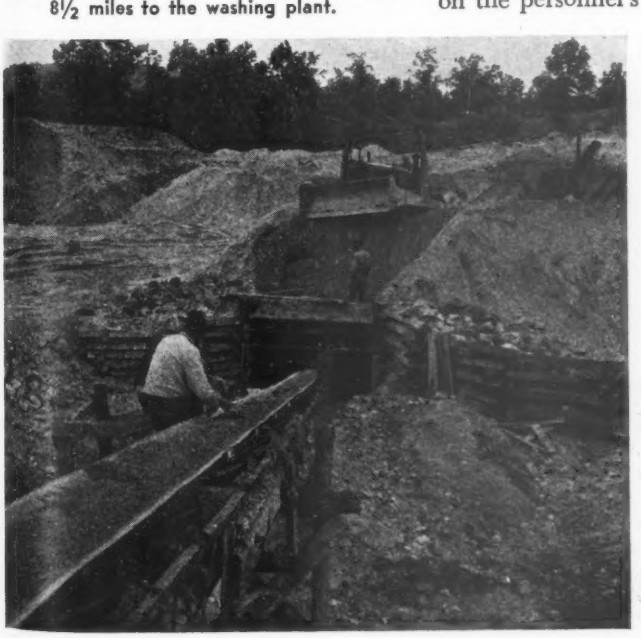
The aggregate length of the conveyors was 295 feet, and it was necessary to have a crew of 13 or 14 men on hand whenever the shovel moved from one bank to another. Shifting the conveyors generally took at least an hour, during which time, of course, production at the pit was at a complete standstill.

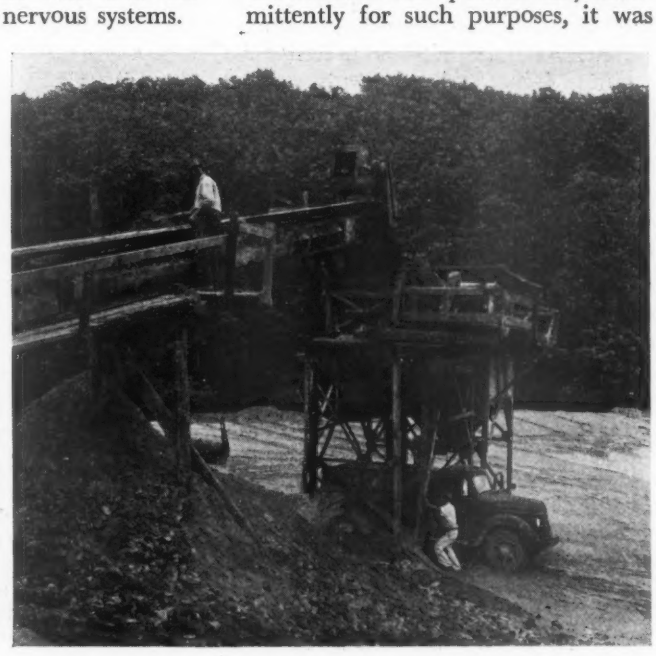
The problem was additionally aggravated by the difficulty of operating the five small gasoline engines with which the conveyors were driven. The engines were of the same vintage, and in much the same condition, as the gasoline drives at the washing plant, and the failure of any one of these was sufficient to stop production at the pit.

For some years the company had operated an Allis-Chalmers Model K bulldozer for stripping and general cleanup work around the pit. Since the machine was operated only intermittently for such purposes, it was

• Below, left: A bulldozer is feeding bank-run silica quartz to a steel hopper straddling the single section of conveyor now in use.

• Right: The screen at the pit is fed by an 18-in. by 76-ft. belt conveyor; it discharges into two steel hoppers used for loading trucks. Throughs are dumped (background), and plus ¼-inch material is trucked 8½ miles to the washing plant.





• Above, left: Multiple field conveyors at the pit were eliminated by using a tractor bulldozer to shove the material from the bank to a feed hopper.
• Right: This 4- by 14-ft. vibrating screen is used at the pit to remove most of the minus-¼-inch material, which is dumped on waste piles. The company ships only one carload of sand to seven of gravel.

decided to reverse the practice, using the bulldozer to feed the scalping screen, and the shovel for stripping and cleanup. The advantages are fairly self-evident. Four sections of field conveyor were eliminated, along with all the drive troubles and the recurring job of shifting and resetting them. The bulldozer now shoves the material from the bank to a portable steel hopper which straddles a single section of 18-in.-wide belt conveyor, 76 feet long. The conveyor, which rests on timber frames, discharges on a Simplicity 4- by 14-ft. double-deck vibrating screen. Only one deck, fitted with ¼-in. mesh cloth, is in use. The throughs and the plus-¼-in. material drop into separate bins. Since about half the pit-run material is minus-¼-in., and shipments are at the rate of only one carload of sand to seven of gravel, most of the throughs are trucked to waste dumps adjacent to the pit.

With this new method of operation, which was tried out for the first time last spring, the pit crew has been reduced from 14 men to 8 men and a foreman, the difference being directly attributable to the elimination of daily conveyor shifts. The additional hour of production thus gained, plus a sharp drop in lost time due to breakdowns, has increased the output of the pit by about one-third. This has so far proved to be more than sufficient to take care of the increased capacity of the washing plant.

As the pit bank recedes it will, of course, be necessary from time to time to move the scalping screen, bins, conveyor and feed hopper in order to avoid an excessively long push for the bulldozer. Such shifts will, however, be infrequent, and present a very small problem in comparison with the daily uproar which accompanied the moving and the resetting of four or five conveyors.

The present pit, known as the Hukel mine, is located in Pike County, near Jackson, Ohio, and is the seventh in which this company has worked since it began operations. The first location was within two miles of the washing plant, but as the various pits have been worked out the haul has increased until at present the distance is about 8½ miles.

About once every two weeks the bank is loosened by the firing of a 4-hole shot, using 300 pounds of 50 percent dynamite to a hole. These small blasts generally yield around 4,000 tons of the silica quartz material. The depth of the present excavation is about 43 feet. The company's products include silica gravel, foundry sand and filter sand for general sale.

R. P. Moody is superintendent in charge of the operation and S. J. Travis is foreman at the pit.

Alaska's Total Mineral Output Increases in 1945

Final statistics show a valuation of $10,210,000 for the total mineral output of Alaska in 1945, an increase of 48 percent, as compared with the valuation of $6,903,000 for 1944, according to the Economics and Statistics Branch of the Bureau of Mines.

The principal gain for the year was made by the nonmetals, including coal, sand and gravel, stone and asbestos, the valuation for which group was $6,478,000 in 1945, as compared with $3,557,000 in 1944 — a gain of 82 percent. Valuation for the entire metals group increased only 12 percent, from $3,346,000 in 1944 to $3,732,000 in 1945. Coal was one of the few nonmetals to decline in production and value in 1945, output totalling 300,000 tons, valued at $1,905,000, as compared with 348,375 tons and $2,239,684 in 1944.

Safety Record Established In Shipping of Explosives

More than 247,000 tons of commercial explosives were shipped safely over the railroads of the United States and Canada during 1945, without injury to a single person or damage to any property from accidental explosion, according to H. A. Campbell, chief inspector of the Bureau of Explosives of the Association of American Railroads.

During the year 458,601,000 pounds of dynamite and 28,817,000 pounds of black powder were used in the United States and Canada. These explosives were important in agriculture, construction, mining and quarrying. Most of the tonnage of explosives was shipped by rail.

Wire Rope Care

(*From page* 80)

worst. Therefore you look for the 15 and 20 percent to fail. In this manner, you do not run the risk of a bad accident.

The foregoing tips are commonplace. All the wire rope manufacturers list them in their handbooks. But the chances are that very few men who actually work with the rope ever see these tips. The intention of this article is to impress the operators with the idea that they must train their men to treat rope with the proper care in order to get the maximum value from it. The wire rope manufacturer doesn't want his rope to wear out unduly fast. He is more interested in keeping your business for the next hundred years than in making a few extra dollars now.

Fifty Years of Liner Practice in Cement Grinding Mills — Part 1

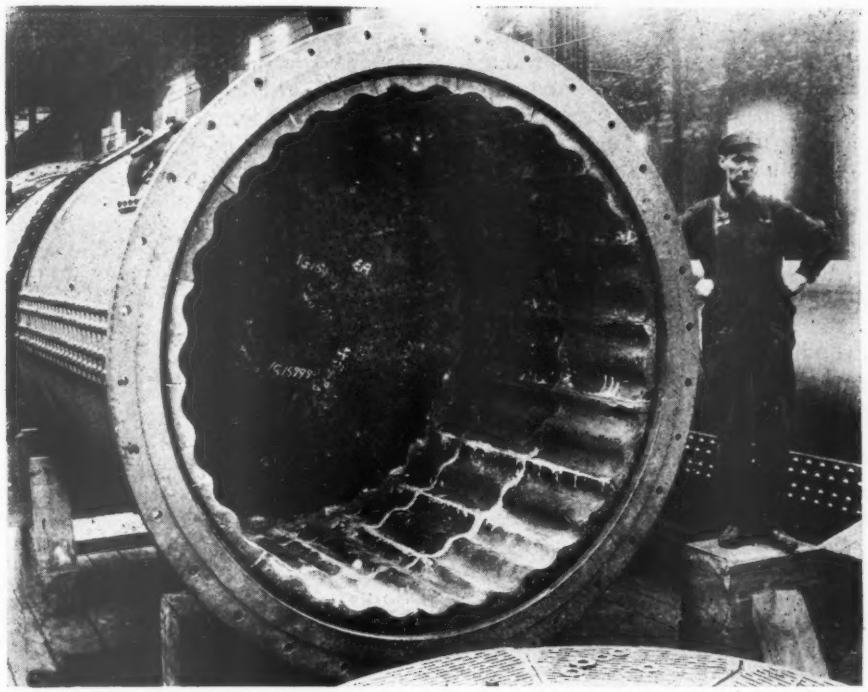
FROM about 1895, the time of the earliest installation of the tubular-shaped grinding mill in portland cement manufacture down to the present day, wood, porcelain, silex, iron and cast and rolled steel have served successively as interior lining material to save the shell structure from destruction by abrasion and impact. Each of these have afforded relative qualities of ruggedness and durability from which one may appraise the quality of the cement produced in each of the past five decades.

By JOSEPH M. WOLFE
Application Engineer
Basic Industries Department
Allis-Chalmers Mfg. Company
Milwaukee, Wisconsin

The cement industry has practiced increasingly-finer grinding of cement and of cement raw materials, based on research which has shown that useful latent properties of cement are thereby developed and enhanced and that finely-ground raw materials within a definite range or particle size result in a more uniform and improved kiln operation and high quality clinker. In this country, fine-mesh sieves are no longer used to give information on the degree of comminution of cement, although it is customary to express raw materials' fineness by this means.

Fundamentally, in grinding processes, molecular forces are overcome and, of course, energy is required to achieve this. It has been proven that work done in producing small particles from large ones is proportional to the increase in surface area developed; therefore, considering equal units of production based on weight, well over 100 percent more energy is absorbed in grinding standard cement today compared to 20 years ago. Raw materials, too, must be more finely divided in order to effect the proper degree of combination when ignited and to permit burning special cements in which the compound content is rigidly specified.

Effects of fine grinding maintained at today's high production rates would probably render grinding equipment of 25 years ago impracticable since replacement of the grinding chamber's lining plates would necessarily be frequent, causing costly interruptions of manufacture and aggregating large sums spent for liners and the labor of installation. These expenditures would be incurred directly by the intense rubbing and pounding of grinding media against shell liners abetted by the abrasive grains and powder which must be comminuted as fine as five microns. Today's liners are much better able to withstand the rigorous duty of fine grinding of raw materials and cement clinker under modern specifications for cement fineness and chemical constitution.



● Wave-type chilled cast iron lining in the preliminary compartment of a 622 tube mill. Zinc has been poured between liners. Beyond the division head is the "ball-peb" or fine-grinding chamber.

However, at the inception of the use of the cylindrical mill for grinding, just before the turn of the century — since cement then was coarsely ground—there was no use for heavy lining materials, nor were there any available. Furthermore, the practice of burning cement clinker was neither well regulated nor too well understood and the product obtained from the kiln could be considered, from modern standards, easily ground. Accordingly, wooden paving blocks or porcelain plates were employed to protect the mill shell from wear occasioned by the grinding media, which consisted of flint pebbles. According to an English report dated 1887 covering the fineness of English cements of which there were more used in this country than the domestic product, the product passed through a sieve having 46 meshes to the lineal inch, or about 10 percent, remained as residue on a 50-mesh sieve.

Cement of 40 or 50 years ago was not comminuted beyond a relatively-coarse powder and while it was harder to grind than modern cement because of its low lime ratio, less power was required in the process. Although the manifold benefits of fine grinding to the properties of portland cement had been recognized and appreciated by 1890, equipment at that time was unable to produce cement at relatively-higher finenesses without seriously reducing capacity. One authority about 1900 declared that purchasers should be willing to pay for the increased expense required to manufacture a fine cement. From this one can surmise that the properties of cement were entirely adequate and satisfactory to the users. In fact, except for specifying odd diameters of wire for testing sieves to the annoyance of manufacturers, consumers paid scant enough attention to the problem of bettering the quality of cement as it was regulated or influenced by fineness.

Just before the turn of the cen-

tury, the tube mill and the Griffin mill were introduced for cement clinker grinding. This definitely marked the end of the era of buhrstones and edge-runners, which had been employed from the earliest beginning of portland cement manufacture and permitted American cement manufacturers to compete successfully against imported cement. The Griffin mill attained great popularity for seven years, but a trend developed about 1905 toward the tube mill which made the latter mill predominant within a few years. Huntington roller mills, Chilean mills and Griffin mills were incapable of the same productional output and energy consumption on hard materials that was possible with the cylindrical-type grinding mill. However, mechanically-refined types of roller or ring-roll mills, such as the Bradley Hercules, Raymond, Ken and Fuller-Lehigh mills were developed and widely used throughout the cement industry between 1910 and 1925 as primary grinders in combination with tube mills and continue in use today in certain plants, especially for pulverizing coal or raw materials.

The interiors of the earliest cylindrical or tube mills about 1900 were lined with porcelain or wooden blocks and loaded with flint pebbles, Alternatively, flint blocks set with neat portland cement mortar served as liners and the so-called "Silex" lining, together with flint grinding media, were employed almost universally until the advantage of higher production obtainable with metallic liners and metallic grinding media, having become apparent as the knowledge of fine grinding progressed, came to be realized in commercial practice.

A 1906 catalog of the Allis-Chalmers Manufacturing Company names either "Silex," porcelain or "Ironite" for shell liners and hard iron for the end liners of tube mills. Only those liners forming the throat or trunnion liner at the discharge end were fastened by bolts. Cast iron liners for the shell were apparently not developed for some few years afterwards as the later editions of this tube mill catalog, dated 1909 and 1913, offer a newly-developed cast iron ribbed lining.

As the section on linings that appears in this catalog is decriptive of the types of liners then available, the method of installing them inside the mills and their applications for various classes of service, it is considered worthwhile to reproduce this section herewith:

"The lining for the interior of the shell of the mill may be made of silex, ironite, or cast iron.

"The silex lining is made from an extremely hard and abrasive rock quarried in Europe and is similar to the flint found in the United States. It is furnished in bricks of about 4 inches in width, 8 inches in length by 2½ inches, 4 or 6 inches in thickness as may be desired. The lining is cemented into the shell, using portland cement. This type of lining has been used to a very large extent in tube mills, both for mining work and portland cement grinding, and has proven very satisfactory.

"The ironite lining is very similar to the silex, but made from a hard, close-grain trap rock found in the United States. The size and shape of the bricks are about the same as silex, and it is fitted into the shell in the same manner.

"The cast iron lining we furnish is made of special mixture of hard iron, the formula of which has been determined upon only after repeated tests and long experience in the manufacture of this grade of material. The lining is made in several different types, namely, the brick, plate, and ribbed.

"The cast iron brick lining is composed of pieces about 1¼ inches thick, and held in place by steel shims wedged between the different pieces.

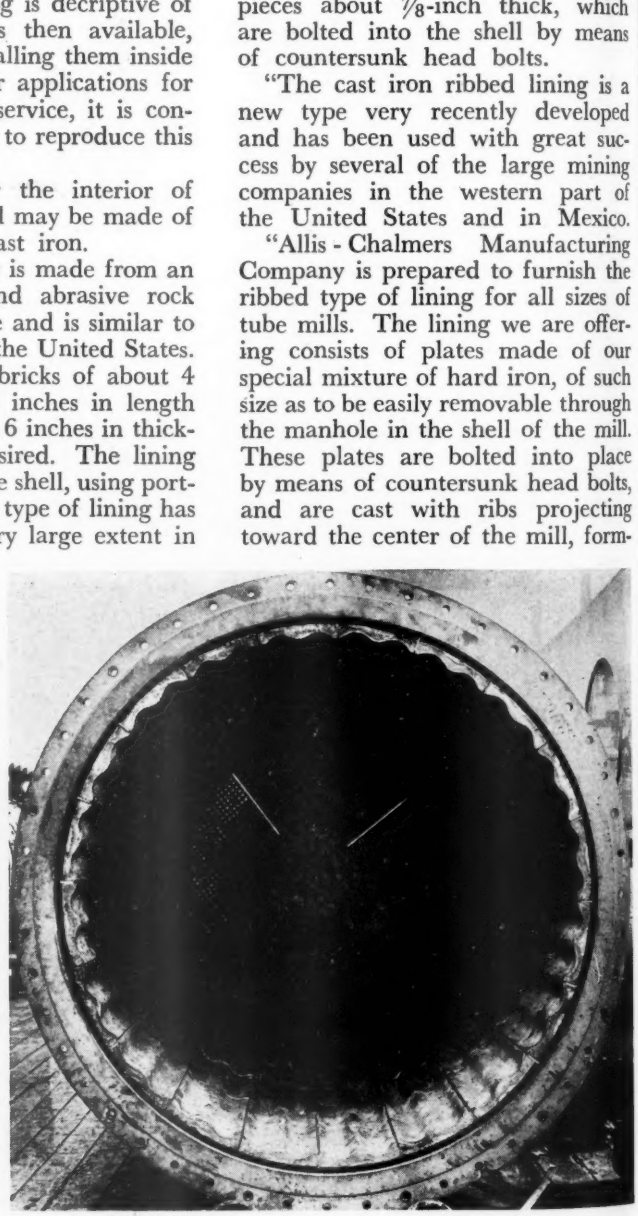
"The plate lining is composed of pieces about ⅞-inch thick, which are bolted into the shell by means of countersunk head bolts.

"The cast iron ribbed lining is a new type very recently developed and has been used with great success by several of the large mining companies in the western part of the United States and in Mexico.

"Allis - Chalmers Manufacturing Company is prepared to furnish the ribbed type of lining for all sizes of tube mills. The lining we are offering consists of plates made of our special mixture of hard iron, of such size as to be easily removable through the manhole in the shell of the mill. These plates are bolted into place by means of countersunk head bolts, and are cast with ribs projecting toward the center of the mill, form-

• Below, left: Tube mill lined with wave-type chilled iron liners having 1½-inch-high ribbed projection. Liners are of wedge design. Pine filler blocks are inserted between liners.

• Right: Wave-type lining of chilled cast iron keyed in position in an early 720 compeb mill. This is a view of the secondary compartment showing the division head that separates the grinding media.



ing channels there between with opposite parallel walls.

"Some concerns have operated tube mills with lining made of porcelain or wood blocks and satisfactory results were secured, and we are prepared to furnish a mill fitted with either the porcelain or wood lining should the purchaser so desire."

Based on initial cost, wooden liners—usually made of 4-inch-thick maple—were the least expensive but their sole application lay in grinding marls, soft limestones and ores under conditions where a small ratio of reduction prevailed and feed was probably smaller than ½ inch. Fairly-effective reduction of coarse limestone to furnished raw product within the tube mill was effected by flint balls up to 4 inches in diameter working in conjunction with pebbles. Rapid wear of wooden liners resulting from heavy pounding by these flint balls and pebbles necessitated more substantial and curable linings which eventually replaced wood entirely.

From 1905 to 1910 cement clinker grinding practice had progressed to the point where pulverizing cement to 92 percent minus 100 mesh was current practice. This was readily accomplished in a primary-grinding ball mill and finish-grinding tube mill. The former had been sometimes though rarely used for clinker grinding from coarse clinker to finished product and in conjunction with the Griffin mill prior to the introduction of the tube mill. Although both steel liners and metallic grinding media were incorporated in its construction, it was not conceded then to be *per se* a fine grinding mill, nor was it suitable for such work owing to the iron contamination of the finely-pulverized product.

In conjunction with the tube mill, the ball mill was employed as a preliminary grinding unit for the reduction of primary crusher product up to 4-inch size, according to current practice of the period. When reduced to 20 to 30 mesh, clinker could be comminuted suitably and economically in the tube mill. Soft raw materials were usually ground in the tube mill alone, although preliminary reduction machines were, in the majority of applications, considered necessary adjuncts to the finish-grinding tube mill due to its inability to handle coarse materials properly.

Metallic liners and grinding media were used in ball mills for effective coarse grinding because large balls of high-specific-gravity materials were needed to break up coarse feed and steel liners were used to withstand the heavy impacts resulting from the high kinetic energy of the balls. Such practice was not extended to tube mills. These commonly had a silex lining and flint pebbles, and ground approximately minus-20-mesh clinker to finished cement and soft raw materials from ½-inch to kiln-feed fineness. Raw materials that had been given an initial reduction in a ball mill to 20 mesh were also handled.

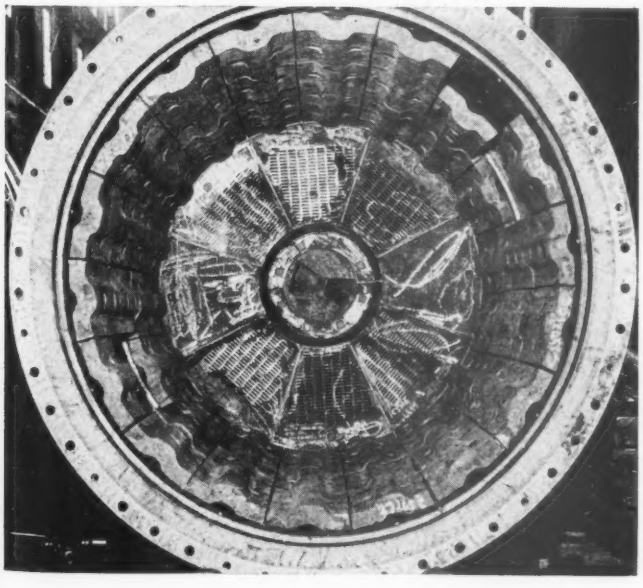
About 1910, five years prior to the appearance of the Compeb mill, grinding was conducted in two distinct phases and the tube mill generally assumed the role of fine pulverizer with Bradley Hercules and ball mills as coarse-grinding machines. In the secondary tube mill, the fineness required in clinker grinding was obtainable with satisfactory output with flint pebbles and flint liners up to about 1910. In instances, hard iron liners were substituted for silex, but because they required more frequent replacement on account of poor wearing qualities and lack of toughness, they were not at once popular.

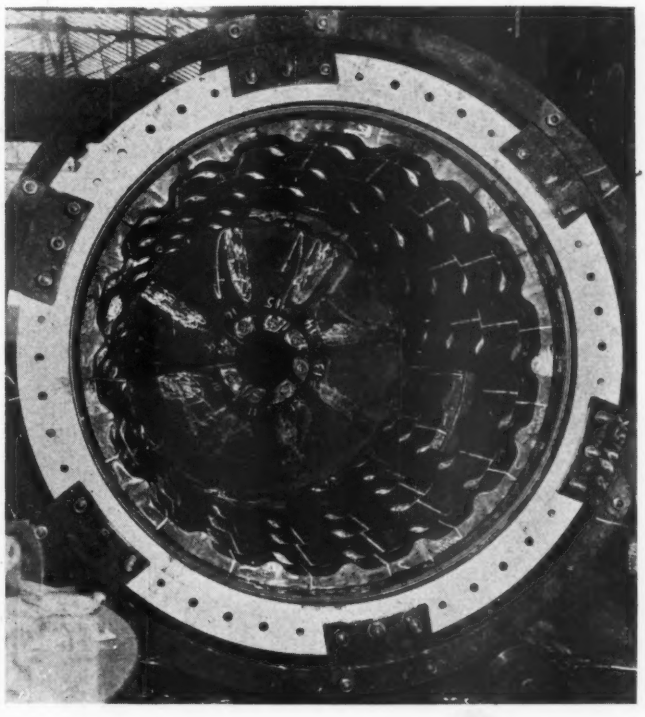
Iron liners were considerably thinner than those of Silex and, within a mill shell of equal dimensions, their use provided more volume for pebbles and consequently more output. Herein lay the incentive to employ high-quality, wear-resistant iron liners which were better able to resist wear in greater degree than those available at the time. When such a superior iron liner was developed, similar to that shown on page 84, the danger of contamination of cement through rapid wear had been overcome for the time being. Both chilled cast-iron liners and grinding media were adopted. High-density metallic grinding media practically doubled the output that could be attained with an equal weight of flint pebbles, and furnished mill operators with the means of grinding superior types of cements and increasing output.

At first even small balls sometimes caused unduly-great breakage of cast

• Right: Finish compartment of dry-grinding compeb mill with chilled cast iron liners wedged in place with pine blocks. Arrangement of liner ribs is staggered.

• Below: Cast alloy steel liners in preliminary compartment of wet-grinding compeb mill before melted zinc is poured into spaces between liners. Liners are of modified wave-type with wide lifter rib.





iron liners. Later liner manufacturers overcame this weakness by refined control of the chemical composition, extent of chill and heat treatment of such liners.

As cement manufacture adopted the practice of preparing a more finely-ground raw product, the scoring and abrasive action of finely-divided pulps in raw wet grinding decreased the useful life of iron liners to such an extent that they were replaced about 25 years ago by steel liners.

About two years prior to the United States' entrance into World War I, the first Compeb mill was installed in a cement plant. The combination of the ball and tube mill into a single unit was an advanced conception of a grinding unit that was widely adopted by the cement industry and enabled operators to produce finely-ground raw materials and cement. The Compeb mill was one of the most important technological developments in the process of cement manufacture and should perhaps be ranked second to the invention and first successful application of the rotary kiln.

Although metallic grinding media and metallic liners had come into fairly prominent use between 1910 and 1915, tube mill design and construction changed little even as late as 1920; an inspection of cement machinery catalogs of that year and texts on cement manufacture of that period will disclose this fact fairly conclusively. Whereas employment of metallic elements instead of flint lining as grinding media greatly increased output, the tube mill could not be loaded with a greater actual weight of metallic balls and liners than prevailed with flint. About 40 percent of the total useful volume that might have been filled with grinding media thus remained unavailable. The early tube mill was not designed to hold a high-level metallic ball charge nor sustain the heavy loads imposed by metallic liners.

A most important factor responsible for ending the era of plant design during which large numbers of relatively small tube mills were incorporated into the grinding section of cement plants, was the introduction of the multi-compartment Compeb mill. The designers incorporated into this machine great strength and ruggedness for heavy duty work and provided it with a shell construction capable of retaining far heavier charges of grinding media than had heretofore been practicable in tube mills. Liners used in the early Compeb mills are shown on pages 83 and 84 (left).

The use of 3-inch-thick chilled cast-iron liners in the preliminary compartment of the first Compeb mills was discontinued after several years. After the performance obtained from even much-improved iron liners in grinding chambers filled with 2-inch to 5-inch steel balls, it was realized that only steel could properly withstand the impact and percussion without breaking and that such steel should be alloyed to resist attrition also, especially in wet-grinding practice.

To meet the need for a tough and durable liner, there were developed special types of improved chrome- and nickel-alloy steels similar to those which had been used for grinding in metallurgical and concentration processes in the mining industry. Such liners as illustrated on page 85 offered standard lining protection for the shell in the preliminary compartments of raw-and clinker-grinding Compeb mills as well as for the fine-grinding compartments of wet raw-grinding mills. Since abrasion prevails in comparatively high degree in reducing granular limestone and clay to finely-divided slurry in wet- grinding secondary-reduction chambers, alloy steel liners only slightly thinner than those used in the primary compartments have replaced chilled iron so that relining does not entail frequent and costly grinding-mill maintenance.

(To be concluded)

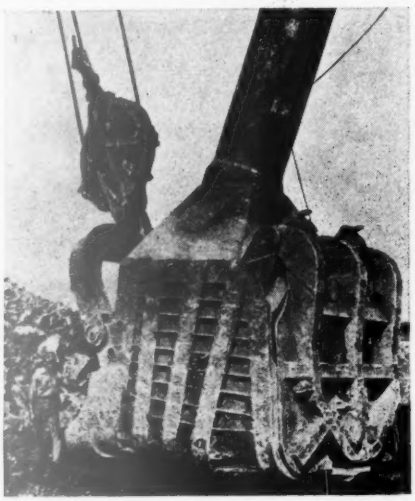
Record Output of Bentonite Triples Pre-War Production

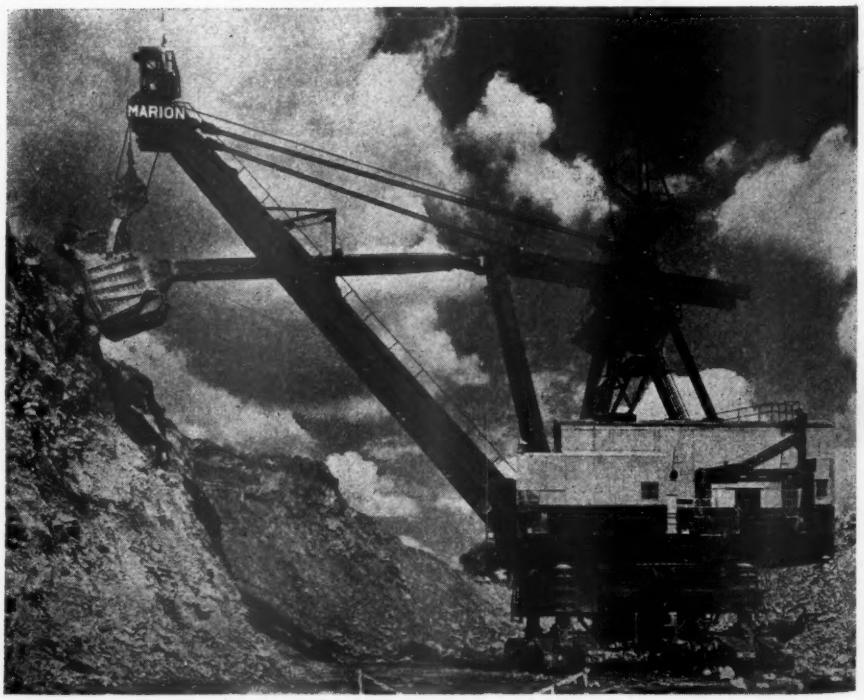
Breaking sales records is becoming a habit of bentonite producers in the United States. In 1945, for the seventh consecutive year, more bentonite was sold or used by producers than in any previous year, according to the U. S. Bureau of Mines. The 1945 output exceeded the 1944 tonnage by 5 percent and tripled that of 1938. The major markets for bentonite have been developed in the foundry and petroleum industries.

Almost 66 percent of the total output came from the Wyoming-South Dakota area.

• Below: A close-up of the Marion 40-cu.-yd. dipper, with the operator beside it to show its size.

• Right: The dipper dumps a load on the spoil pile at the Hanna Coal Company mine near Cadiz, O. Note the size of the machine in comparison with the man standing along the railing near the center of the cab.





Agricultural Limestone Produced From Bank-Run Gravel

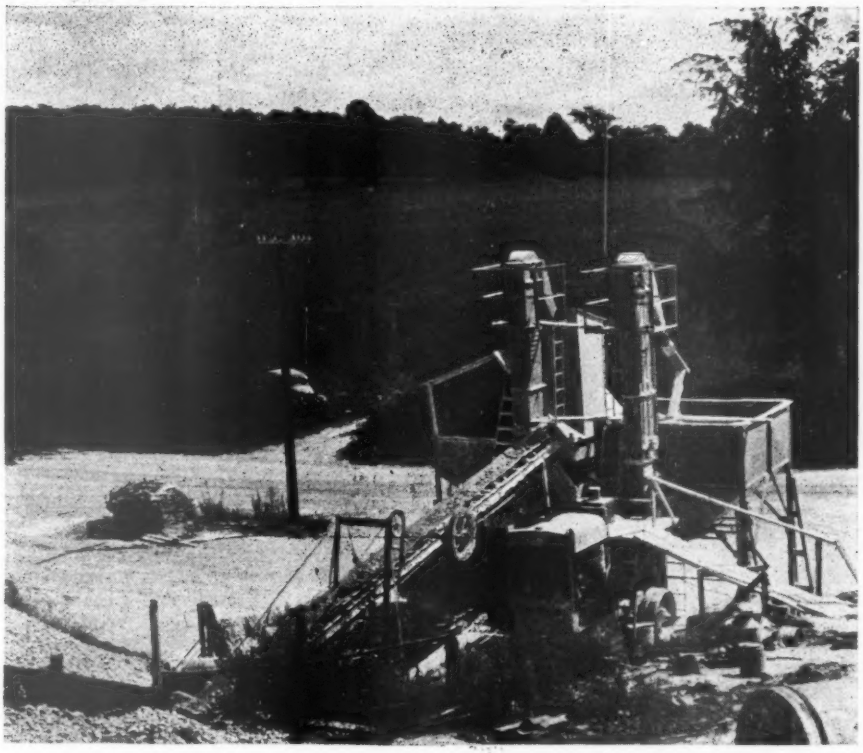
By FLOYD C. LEVERETTE

another ON THE SPOT report

IN AN effort to satisfy the "agricultural limestone famine" in the southeastern section of the state of Wisconsin 10 years ago, Sheboygan County purchased a 40-acre tract of land near Plymouth, Wisconsin, which contained bank-run gravel having desirable qualities for use as agricultural limestone, and set up a pulverizing plant. Though the deposit is going into its tenth year of exploitation, the plant underwent a modernization change about two years ago. The new plant, which has a potential output of from 40 to 60 tons of agricultural limestone per hour, is designed and set up as a semi-portable unit.

The topography of the deposit is hilly, with very little overburden. The recovery of the bank-run gravel, of which an extremely small percentage exceeds 3-inch size, is done with a Drott dozer-loader which is used to feed the plant directly when the deposit is being worked near the plant. As the face of the open pit recedes, the dozer-loader is used to load the dump trucks which haul the raw material to the plant.

The contour of the terrain has been used to advantage in reducing materials handling as the various stages of the plant have been placed at different levels of a gently sloping section of the deposit. At the highest level, a large hopper has been installed to receive the gravel from the dozer loader or dump trucks. The material is discharged from this hopper on a 24-inch belt conveyor which in turn feeds two Model 18 Gilson pulverizers. As the material leaves the hopper, an inspector, who is on constant duty, examines and rejects that material which appears to have excessive impurities before it reaches the pulverizers. This stage of the operation is enclosed in a protective frame structure.

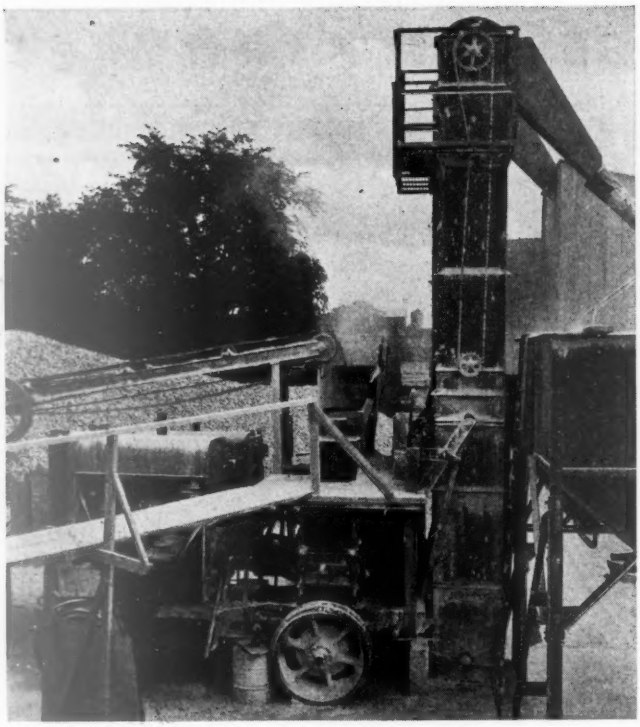


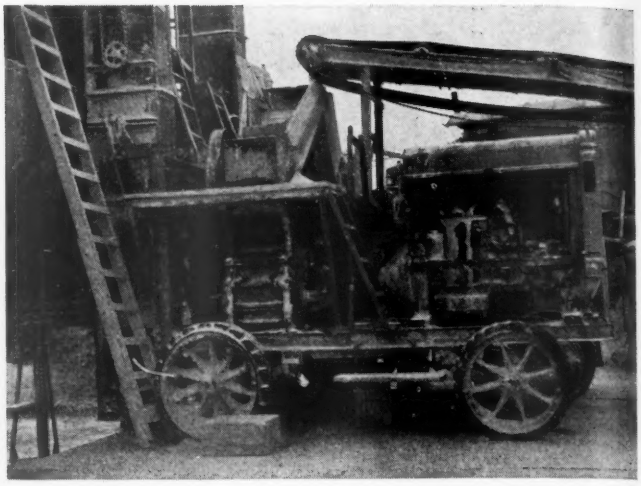
• View of plant with dual crushing, elevating and storage system.

• Face of bank run gravel deposit used in producing agricultural limestone.

At the discharge end of the conveyor, an inverted Y-shaped chute arrangement permits the single conveyor to feed the two pulverizers. These pulverizers, the hammers of which can be reversed and used before it is necessary to build up the worn portions with welding rod, are each mounted on a shortened, rubber-tired truck chassis for portability. Mounted on the truck chassis of one pulverizer is a 100-hp. Hercules gasoline engine with a direct drive to the pulverizer; on the other, a 100-hp. Waukesha gasoline engine drives the second pulverizer with a similar direct drive.

The pulverizers feed a pair of 20-foot enclosed bucket elevators, also Gilson products, which are belt driven from the main shaft of the respective pulverizer. Each bucket elevator discharges the finished product into a Gilson all-steel, overhead-type storage bin of 20-ton capacity. This dual-channel type of plant was designed and built by Gilson Brothers of Fredonia, Wis-





• Above: Portable plant uses two pulverizers with single feed conveyor. Each pulverizer has a separate elevator and storage bin in this dual channel flow of material.

• Left: Two 100-hp. gasoline engines drive each of the pulverizers.

consin, to provide flexibility of operation, to eliminate a complete production stoppage in case of a breakdown, and to keep the equipment at a size more suitable for a portable arrangement.

The agricultural limestone produced at this plant tests approximately 98 percent calcium carbonate equivalent, with 68 percent passing 60 mesh and 100 percent passing 80 mesh. Since the plant itself is located but a few feet from the highway, it is convenient for trucks to drive in under the bins, receive a load, and clear the plant with a minimum of congestion. The limestone is sold on either a volume or tonnage measurement basis, depending on the consumer's desire. Transportation of the product from plant to farm is provided by county-owned dump trucks when available and needed, private haulers hired by the consumer, or by the consumer if he has his own means of hauling.

Eastern Gypsum Firms Nearing Capacity Output

The two companies which supply more than 90 percent of the East Coast's gypsum products have assured the office of Housing Expediter Wilson W. Wyatt that they are now approaching full-capacity output.

Representatives of United States Gypsum Company and the National Gypsum Company have informed government officials that their plants throughout the East are now close to top-speed, three-shift, six-day operations. They reported also they are no longer hampered by a shortage of imports of gypsum rock from Nova Scotia, source of the crude gypsum.

Following numerous reports — from builders and gypsum producers themselves — that shortage of vessels and high freight rates were limiting gypsum rock imports and thus the output of gypsum products, the Inter-Agency Committee on Premium Payments invited members of the industry to meet here. Representatives of United States Gypsum, National Gypsum, Newark Plaster Company, and Connecticut Adamant Plaster Company attended the sessions.

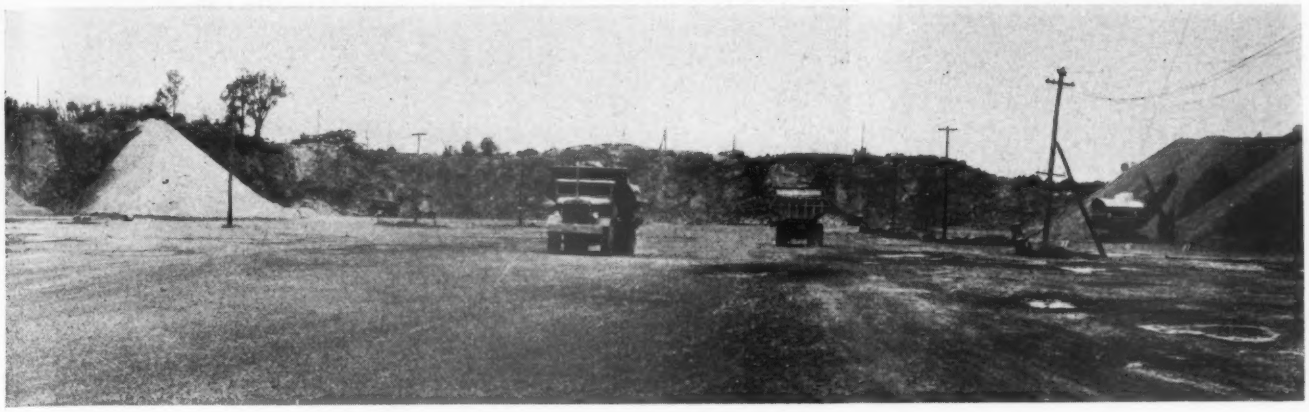
One of a fleet of quarry trucks recently put into operation at the Marquette Cement Manufacturing Company's plant at Cape Girardeau, Mo. These 32-ton Mack trucks are powered by super duty Cummins 200-hp Diesel engines, and mount a 15-ton capacity Gar Wood body and hoist. The firestone quarry tires, 14.00 by 24 on the front and 16.00 by 24 on the dual rear wheels, have a rated capacity of 66,940 pounds. An air booster arrangement makes it possible to turn these trucks within a 27½-foot radius. The overall height is 11½ feet.

A rock crushing plant has been installed by L. M. Chambers of Kansas City, Missouri, near Berlin, Missouri. The ten-man crew and several truck drivers will be under the supervision of M. L. Teeter of Pattonsburg, Missouri, the plant foreman. Approximately one-half of the daily output of the plant—40 to 50 tons—will be agricultural limestone, the remainder crushed road rock.

Herbert Burnham, son of the former owner of a brick plant at York, Nebraska, which has been closed since 1930, has reopened the factory under the name of the York Brick and Tile Company and has added a gravel business employing 30 men.

New England Firm Achieves Economy By Improved Quarry Methods

By WILLIAM M. AVERY



another ON THE SPOT report

THE Lynn Sand & Stone Co., located at Swampscott, Mass., 13 miles north of Boston, has recently completed a $200,000 improvement program in its quarry operations. Primarily aimed at increased manpower efficiency in the quarry, its program has not only handsomely achieved this objective but has yielded an unexpected 20 percent increase in capacity, amounting to approximately 50 t.p.h.

The company is one of the largest producers in New England of commercial stone for railroad ballast, road building, breakwaters, concrete, concrete pipe and allied uses. In common with most stone producers, its quarry operations were seriously hampered during the war period by shortage of manpower, and the emphasis now being given to the problem of quarry labor efficiency is largely a result of this experience. Probably the most effective measure of the program's achievements to date is the startling reduction in the size of the working force—now about 40 men, compared with the crew of 60 formerly employed. Bear in mind that this reduction was accompanied by an *increase* in production. The company is convinced that its $200,000 outlay of capital will be returned within a few years, a truly outstanding example of what can be accomplished in stone operations with well-invested capital.

• This general view of the Lynn Sand & Stone Company quarry shows most of the 1,500-ft. working face. The loaded truck in the foreground is enroute to the crusher, the receding truck is returning and the third unit is at the face being loaded. Note the somewhat unusual practice of stockpiling processed stone against the quarry face.

• The new 4-cu.-yd. electric shovel loading one of the 16-ton diesel trucks. One of the five well drills is operating on the ledge above the shovel.

The Lynn company's rock formation is a hard, tough abrasive gabbro-diorite, exceedingly difficult to drill and even more difficult to blast. To furnish something over 2,000 tons of stone per day for the crushing plant, five well drills are kept busy putting down blast holes, spaced 14 ft. apart with an average overburden of about 20 ft. The holes are loaded with 5- in. by 24-in. cartridges of 75 percent and 60 percent Extra Gelatine dynamite, with a maximum charge in a 2-hole shot (limited by request) of 1,200 pounds. Persistent experimental effort over a period of years has achieved relatively good breakage considering the difficult character of the stone, but the problem of reducing oversize stone has always bedeviled the quarry operation. From 25 to 35 percent of an average initial blast consists of stone too large to be fed to the primary crusher.

Before the shovels could be put to work in the bank following a primary blast, for years it was the practice to blast the larger stones by the block hole method. Hundreds of block-hole shots were required after each primary blast. Under normal conditions a crew of 11 men was employed constantly on secondary blasting. This group consisted of 6 jackhammer operators, 2 light drifter operators, a blaster and a helper, and a drill sharpener. A large pipe with drop hoses along the top of the ledge furnished air for the 2-man drifters, and a truck-mounted portable compressor supplied the jackhammers. Between 100 and 150 block holes were detonated daily.

• Above: This closeup of the drop ball shows the latest product of the company's research. The boom is octagonal in shape, measuring 22½ inches across the flats and 48 inches high.

• Right: The drop-ball crane is a new 1½-cu.-yd. machine purchased just for this work. It has a 60-ft. boom.

The holes were loaded with small charges of 75 percent Extra Gelatin dynamite, primed with No. 6 blasting caps and safety fuse, and fired by hot wire lighters.

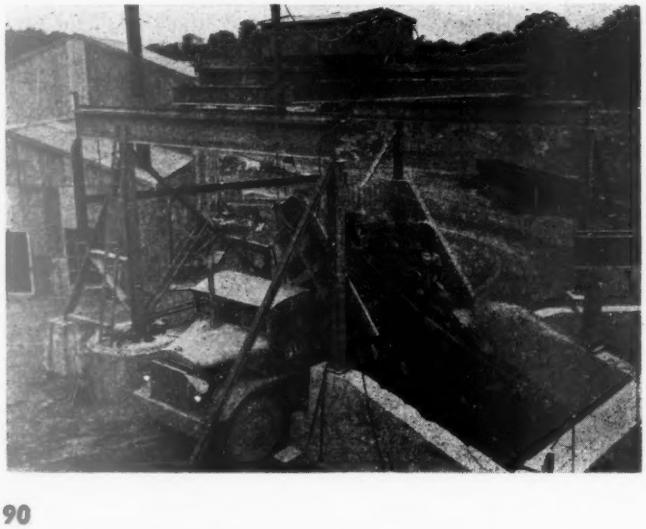
Wholly apart from the expense and nuisance of this procedure, the work was exceedingly hazardous. Over a period of years half the injuries sustained by the company's employees were suffered by members of the drill crew. The mere presence under the quarry ledge of so large a group of men constituted a serious hazard in itself, quite aside from the nature of the work they performed.

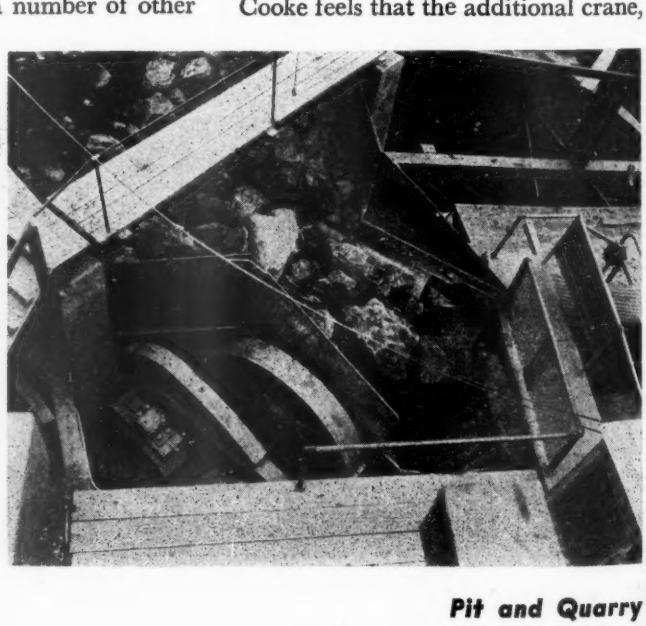
About three years ago, when the manpower shortage made it virtually impossible to keep an adequate drill crew in the quarry, the company in desperation began experimenting with the use of a drop ball to reduce oversize stone. In the beginning it was regarded as purely a stop-gap measure, to be used only until such time as qualified drillers could be employed, but as the development progressed Ted Cooke, the company's alert, aggressive president, became increasingly interested in its possibilities as a permanent quarry tool. As a direct result of his interest the company has probably done more pure research and development work on the drop ball than any other concern in the United States.

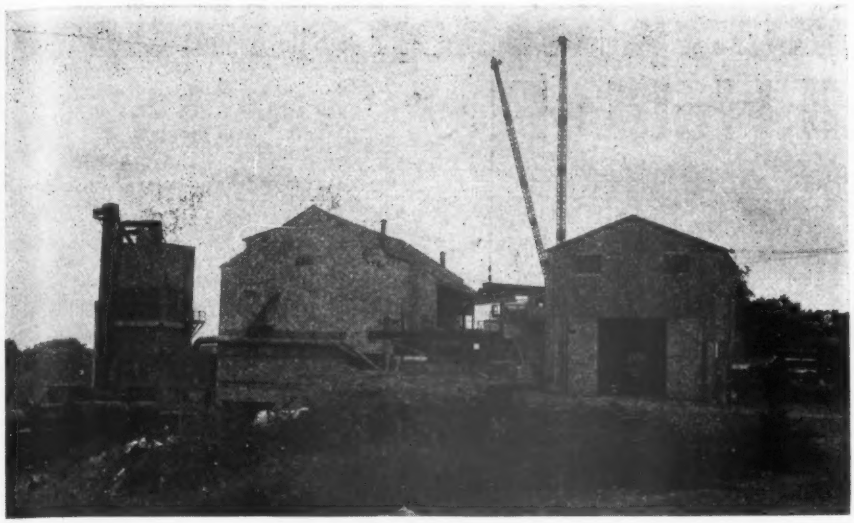
Since a more complete discussion of the drop ball, including Mr. Cooke's important contributions and the experience of a number of other operators, will appear in an early issue of PIT AND QUARRY, the present discussion will concern itself mainly with the results obtained at the Lynn Quarry. The drop ball seems permanently to have eliminated the block-hole gang, and along with it all the expense, nuisance and hazard of working a relatively large crew of men directly under the quarry ledge. A single crane operator is now doing the work of the 11-man crew, and getting far better breakage than was ever achieved by secondary blasting. Results have become increasingly good as the company and its men have gained experience with the tool. Since about 30 percent of the quarry's output requires secondary breaking, a special crane for the drop ball was regarded as a good investment, particularly in view of the fact that the drop ball operates hour-for-hour with the shovel. Even in quarries requiring considerably less operation of the drop ball, Mr. Cooke feels that the additional crane,

• Below, left: One of the new hauling units being dumped at the primary crusher. The dumping structure was designed and built by the company. Through traffic movement was one of the important achievements of the improvement program.

• Right: The 60-in. by 15-ft. feeder is set at an angle of about 45 degrees with the 48- by 60-in. jaw crusher. This was done to obtain through traffic on the truck roadway.







• A general view of the crushing plant. Quarry trucks circle the forge shop in the right foreground. The 100-ft. steel derrick services the entire plant.

which would be available for a wide range of miscellaneous jobs, might prove to be a very sound investment.

The new Marion crane recently purchased for the operation of the drop ball is a 1½-cu. yd. machine with a 60-ft. boom. One operator is kept on the crane the greater share of the time, since considerable skill and judgment are required to maintain high production.

Formerly the blasted stone was loaded by two 2½-cu. yd. electric power shovels into six 7½-cu. yd. side dump auto trucks. The recently completed program of modernization included the purchase of a P & H 1400 4-cu. yd. electric shovel to replace the two smaller units, and three 16-ton Euclid Diesel trucks for hauling stone to the primary crusher. In this instance modern equipment has enabled six men to do the work of ten, with an actual increase in production from 250 t.p.h. to 300 t.p.h. The new shovel is thought to be the largest operating in the New England states. An Allis-Chalmers HD-7 bulldozer is engaged intermittently in cleaning up around the shovel to keep the approaches clear for the Euclid trucks.

The location of the primary crusher made it necessary under the old setup for the trucks to back into dumping position. The dumping operation was accomplished with a 10-ton overhead electric hoist, and the material fell directly into the crusher. In order to obtain through traffic movement, a 60-inch by 15-foot Allis-Chalmers primary crusher feeder has been installed at an angle to the jaw crusher. A steel framework straddles the truck roadway and supports the 10-ton electric hoist with which the trucks are dumped. The hoist is mounted on a conventional crane bridge which imparts both lateral and longitudinal movement to the unit during the dumping operation. The rather unconventional angularity between the feeder and the crusher has not caused the slightest trouble, and the achievement of through traffic movement enables the haulage operation to go on with almost clock-like precision.

The Lynn Sand & Stone Co. was founded in 1922 by James H. Cooke, and the operations have been carried on continuously by the Cooke family. In 1930 the first of several subsidiary plants was constructed adjacent to the quarry to provide a dependable outlet for the smaller sizes of stone. The concrete pipe plant constructed at that time is said to be the only one on the East Coast using the Hume process for making centrifugally cast pressure pipe. Later in the same year a bituminous concrete plant was built on the property. In 1932 a batching plant was erected for transit-mixed-concrete operations.

Oregon Concern Begins Producing Aggregates at Grants Pass Plant

PRODUCTION is scheduled to begin some time this fall at the new aggregates plant now being erected by the Grants Pass Sand and Gravel Company of Grants Pass, Ore. The plant is situated on the banks of the Rogue River, a few miles east of the city, raw material to be excavated by a ¾-cu. yd. Sauerman slackline cableway excavator from the bed of the river.

A Western-Case double-drum hoist will operate the cableway. Primary crushing is to be handled by a 10- by 20-in. Pacific jaw-crusher, with an Allis-Chalmers Type R reduction machine doing secondary crushing of the oversize. Vibrating screens and the sand drag were designed and built by the owners, R. W. Griffith and E. N. Gray.

Wash water will be taken from the Rogue River, pumped by a Jaeger centrifugal pump. Power for operating the equipment will be supplied initially by two Case oil-fueled industrial engines and a Continental Red Seal gasoline engine. As soon as electric power becomes available, electric motors will be installed.

Shipments will be made by truck. The plant is expected to average about 75 t.p.h. of finished material.

• Located on the banks of the picturesque Rogue River is the new plant, now nearing completion, of the Grants Pass Sand and Gravel Company, Grants Pass, Ore. The plant will have a capacity of about 75 t.p.h.

Cement and Quarry Section of National Safety Council Holds First Session

another ON THE SPOT report

THE first meeting in two years of the Cement and Quarry Section of the National Safety Council, got under way on the afternoon of October 9, during the annual National Safety Congress and Exposition in the Stevens Hotel, Chicago. Johan Norvig, general chairman of the section and superintendent of the Pennsylvania-Dixie Cement Corp., Nazareth, Pa., opened the meeting with a welcoming address and the annual report of the general chairman.

Mr. Norvig announced the completion of the "Safety and Quarry Operations Manual", and stated that the 4,000 copies already printed are being distributed. In his opinion, every quarry superintendent and foreman should have a copy of this manual. He continued by discussing the nationwide safety contest which has been started in 35 plants of the brick and tile industry and the other contests to be launched by the section in the interest of accident prevention. A Visual Aid Committee has been organized to promote safety education through visual media, found to be the most efficient way of setting forth the principles of any safety program. In closing, Mr. Norvig welcomed the new members of the section who number 22 since the last membership report.

Following Mr. Norvig's report, Wallace E. Wing, president and general manager of the Marblehead Lime Co. of Chicago and chairman of the Nominating Committee, presented the names of the candidates, selected by his committee, to be voted upon as officers of the Cement and Quarry Section for the coming year. J. F. Buffington, New York Trap Rock Corp., was nominated and elected to succeed Mr. Norvig as general chairman of the section for the coming year.

Forrest T. Moyer, chief, Accident Analysis Division, Economics and Statistics Branch, U. S. Bureau of Mines, discussed the "Analysis of Cement and Quarry Accident Experience". According to Mr. Moyer, the cement and quarry industries had an improved over-all injury experience in 1945 as compared to 1942, despite the increased hazards confronting the industries during the four war years, 1942-1945. The average frequency rate for this period was 34.44 per million man hours compared with the 38.76 average for 1936-1939.

• Left to right: Johan Norvig, superintendent of the Pennsylvania-Dixie Cement Corporation, Nazareth, Pa., the retiring general chairman of the council's Cement and Quarry Section; J. F. Buffington of the New York Trap Rock Corporation, the new section chairman; Ivan Le Gore, assistant manager of the Accident Prevention Bureau, Portland Cement Association, Chicago.

The final topic, for this first session of the section, was a panel discussion on "Incorporating Safety Into Production", led by discussion leader, M. C. M. Pollard, safety director of the National Gypsum Co., Buffalo. In opening the discussion, Mr. Pollard advised that much hard work will have to be done to bring safety practices up to date and to incorporate safety in production.

The first speaker on the panel, Paul B. McInerney, safety supervisor of the Certain-teed Products Corp. of Chicago, discussed the subject of "Why Production and Safety Go Hand-in-Hand." The reduced accident frequency rate in the fifteen plants operated by his company was cited by Mr. McInerney as evidence that an adequate safety program working as an integral part of the production department will produce satisfactory results, both in accident prevention and in production efficiency. This was substantiated on the premise that safety practices affect operating and production costs, employee morale and equipment, which in turn have a direct effect on the production schedule or program. Good housekeeping practices were mentioned as an important factor to the success of any safety or production plan.

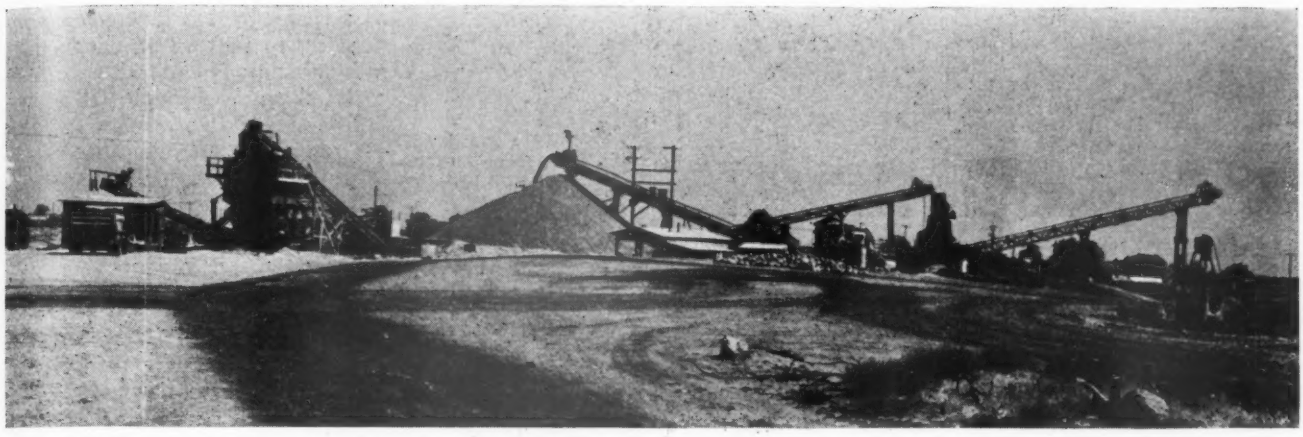
"How To Incorporate Safety In Production" was taken up by John Kraus, regional manager, Liberty Mutual Insurance Co., Chicago. To accomplish this, Mr. Kraus stressed the necessity of adopting a company safety policy and then seeing to it that it is carried out. A safety program should consist of two parts, prevention of accidents, and correction of accident causes. Accident prevention is best carried out by safety consciousness in the planning stage of an operation, giving special attention to plant lay-out and equipment and methods of production to be employed. Cooperation between safety and production personnel is necessary to do a satisfactory job in the planning stage. The speaker also stated that safety committees are necessary, as they are needed to advise the safety engineer and to assist in the execution of a safety program by educating production personnel in the principles underlying the program.

Emil Meuser, safety engineer, March & McLennan, New York City, stressed the affirmative answer to the question, "Should Production Management and Supervisory Force Be Bothered with Safety Enforcement and Problems?" Mr. Meuser explained that safety enforcement and problems are not just something to be delegated to someone who will be responsible for them, but that they should be an integral part of

(*Continued on page* 96)

Portable Aggregates Plant Develops Into Five-Unit Layout

By HARRY F. UTLEY



• A general view of operations of the Tracy Rock & Gravel Company at Tracy, Calif. Left to right: Road-mixplant, surge pile, conveyor to the washing-and-screening plant and sand-stockpiling conveyor.

another ON THE SPOT report

GEORGE FRENCH, JR., a general contractor of Stockton, Calif., had a small portable aggregates plant operating on a deposit a few miles south of Tracy, Calif., about three years ago when he won a government contract to supply 750,000 tons of crusher-run base material. By assembling some additional portable units at the deposit he was able to produce the required tonnage, which went into airport runways at Rough-and-Ready Island of the Stockton Naval Annex.

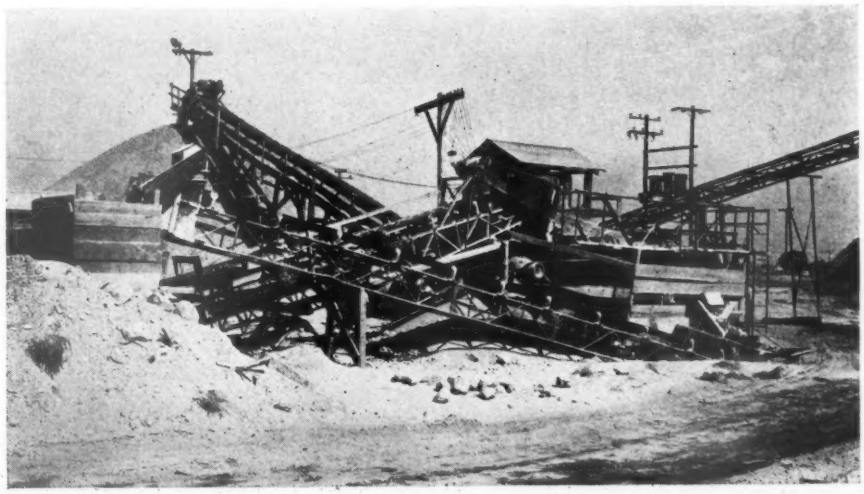
After completing the Rough-and-Ready job, Mr. French decided to continue producing aggregates as a commercial venture, and on a large scale, at the same site, acquiring additional acreage to bring the total deposit under lease to 154 acres. So satisfactorily had the portable plants functioned that Mr. French planned his entire operation on a unitized basis, so that the plant today consists of separate (1) a primary crushing plant, (2) a washing-and-screening plant, (3) a crusher-run plant for road material, (4) a roll-crusher plant which produces asphaltic fines operates on finished material brought over from the washing-and-screening plant, and (5) an aggregate-bituminizing plant.

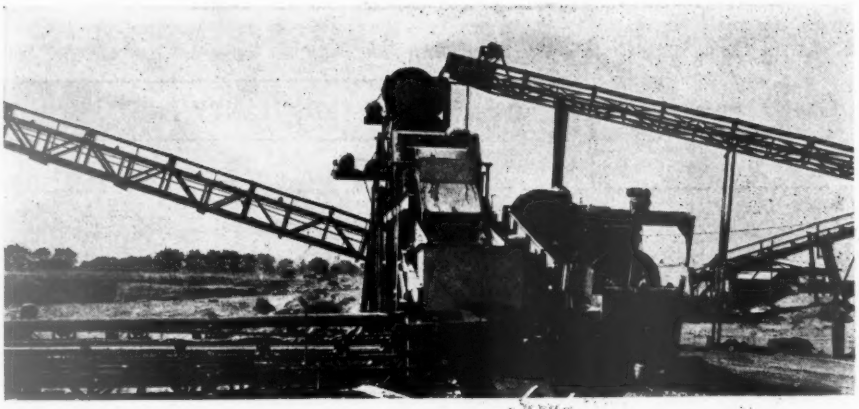
Production capacity totals about 500 t. p. h., including 200 tons of washed-and-screened material and 300 tons of blended road rock. A large portion of the output is shipped by rail, the plant being located on the Western Pacific Railroad with a spur track accommodating 35 cars. Stockton and its environs provide the chief market, although increasing tonnages are being shipped into the San Francisco Bay area. The concern is now known as the Tracy Rock and Gravel Company.

Overburden is stripped with a Northwest diesel-powered dragline carrying a 1-cu.-yd. bucket, and the material is excavated by still another dragline, a P. & H. 655A equipped with a 1½-cu.-yd. bucket. The main intra-plant transport units are two Mississippi Wagons drawn by International M-R-S special diesel tractors. These are used for hauling spoil to a worked-out pit section as well as for transporting pit-run aggregates to the primary-crusher plant. They are hydraulically-operated bottom-dump units which carry capacity loads of 10 to 12 cubic yards per trip. Depending upon the length of haul from pit to plant, these two units bear the brunt of the hauling job, supplying as much as 375 t. p. h. —or 75 percent of the total plant capacity. When capacity operations are underway, additional earth-moving units are pressed into service, but in normal service the two Mississippi Wagons can carry the load.

The wagons discharge over an 8-inch rail grizzly to an underground hopper where a belt feeder (designed and built by Mr. French) puts the load on a belt conveyor which feeds the Austin-Western 10- by 36-inch primary jaw crusher, a 3- by 12-ft. single-deck Niagara scalping screen, first by-passing the sand and gravel smaller than 2½ inches in size. The crusher is in closed circuit with the conveyor and screen, another short belt making the return. The crushed and uncrushed minus 2½-in. screen throughs are carried by a stacker belt to a surge pile beneath which is a reclaiming tunnel. Two

• The scalping screen and primary crushing unit. The crusher is in closed circuit with the feed belt; the return conveyor is in the foreground.





• The washing-and-screening plant. Note the large-diameter sand washer. Vertical conveyors (at the left) carry finished material to the truck-loading bins, which are located below in an abandoned section of the pit.

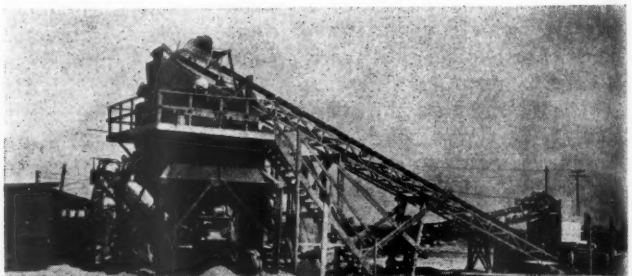
belt conveyors operate in the tunnel, one carrying the material in an easterly direction to the washing-and-screening plant, the other in an opposite direction to the road-rock plant.

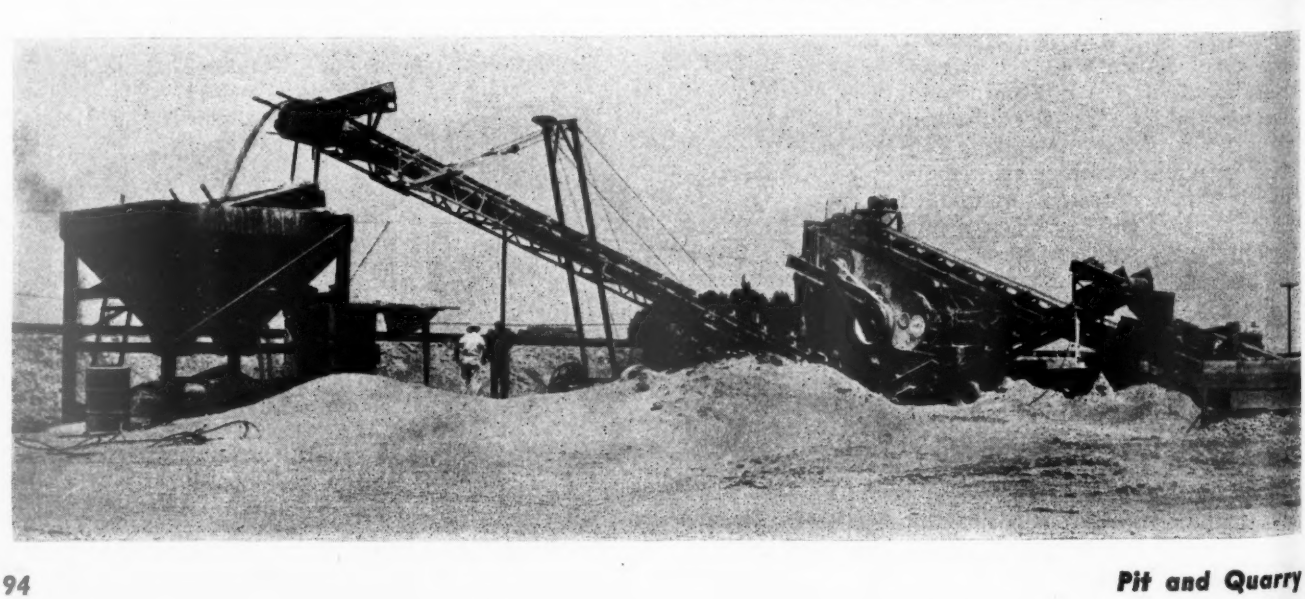
One tunnel belt transfers its load to a 24-in. by 115-ft. conveyor running up to the top of the washing-and-screening plant where all the material passes through two French-built 4- by 10-ft. revolving scrubbers —first through one, then through the other—for thorough washing before being sized. The main sizing screen is a 4- by 12-ft. Cedarapids double-deck unit, the top deck normally being fitted with 7/8-in. mesh with the lower deck divided between 3/16- and 3/8-in. screen. Plus 7/8-in. rejects pass to a 4- by 6-ft. Niagara single-deck screen carrying 1 5/8-in. mesh. Both sizing units are equipped with Link-Belt spray nozzles to complete the washing process. The four sizes of gravel are carried by a like number of short horizontal belt conveyors to a four-compartment-in-line truckloading bin, each compartment having a capacity of about 50 tons. This bin is located some 30 feet below the plant level in an abandoned pit section, so that the horizontal conveyors which carry the finished gravel to it operate on a plane slightly above the top of the bin.

• Above: Another view of the washing-and-screening plant, showing the two scrubbers, the truck-loading bins (lower level) and the stacker conveyor which stockpiles the sand.

• Right: The road-mix unit, which crushes but does not wash the material. It is shipped as a blended mixture, largely by rail.

• Below: The roll-crusher unit, which processes the washed material trucked over from the washing-and-screening plant. The output is largely fines used in hot-plant mixes.

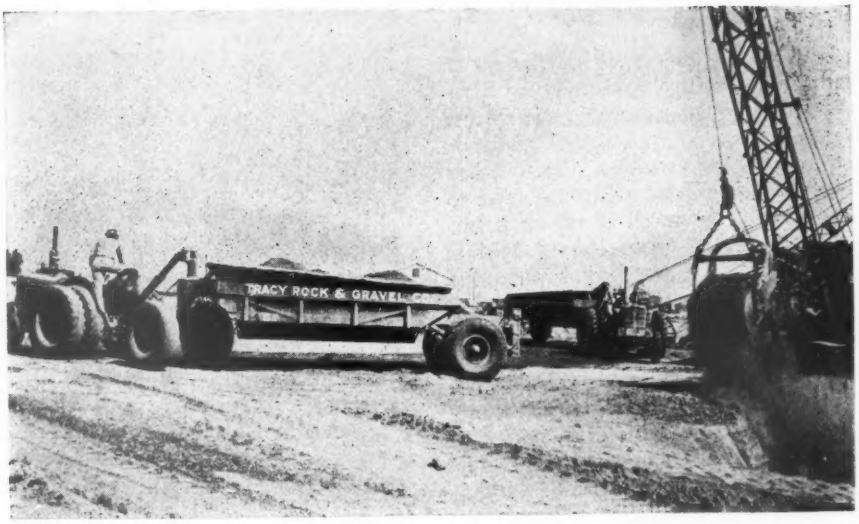




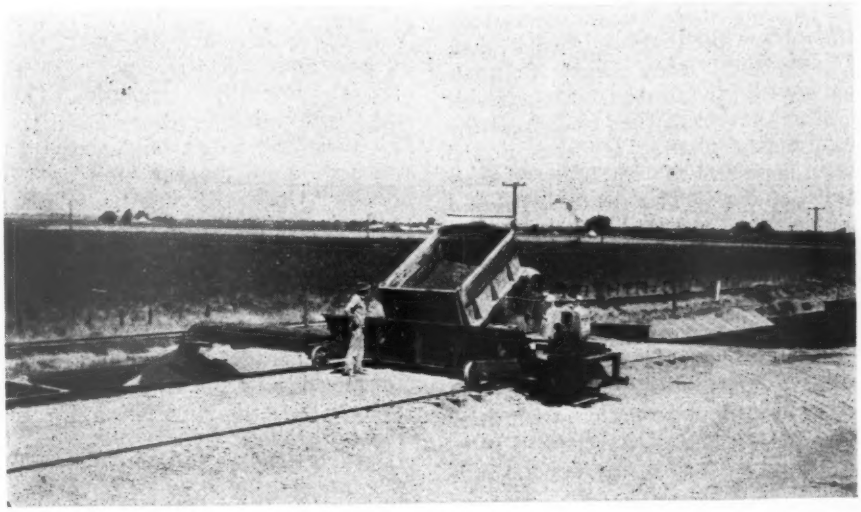
The minus 3/16-in. concrete sand taken out at the screen is chuted to a Wemco 6- by 28-ft. screw washer. The clean, dewatered sand is discharged at the upper end of the washer tub to a 100-ft. stacker conveyor which builds the stockpile on the old pit floor below, all sand being held in open storage. An 8-cu.-yd. dump truck is in almost constant service carrying gravel from the bins to reserve stockpiles. Washed aggregates shipped by truck are normally loaded at the bins. Sand (also coarse aggregates if shipped by truck from stockpiles) is loaded into delivery trucks by a new Athey Mobi-Loader of the latest design. Some truck loading is also done by a Model 2 Northwest ¾-cu.-yd. clamshell crane which rehandles at the stockpiles.

Washed gravel and sand shipped by rail are carried by dump trucks to a special car loader designed and built by Mr. French and only recently placed in service. It consists of a 36-in. by 30-ft. belt conveyor mounted horizontally on a steel carriage which moves along a track of 12-ft. gage. The four flanged wheels have Ford-type hubs so that pneumatic-tired truck wheels can be substituted, should it ever become desirable to use the unit without tracks. The wide-gage track is on a level well above the railroad spur. The trucks discharge into a hopper which feeds the belt, and the material is transferred into the open-top cars. The loading conveyor can be moved along the string of cars much more easily than moving the cars themselves, as was formerly the case when loading was done from a fixed point. It is of interest that the belt, rolls, and idlers used by Mr. French in building the loader formerly were in service as part of the 9.6-mi. belt conveyor which carried the aggregates from Redding, Calif., to the construction site of Shasta Dam. Power for operating the loader is supplied by a 20-hp. Wisconsin gasoline engine mounted on the carriage.

Returning to the surge pile of minus 2½-in. material, a second belt in the reclaiming tunnel moves the material to the road-rock screening-and-crushing unit. This is a dry



• A dragline loading a truck at the deposit.



• A conveyor-loader designed and built by Mr. French. Dump trucks bring the washed material to this unit, which loads waiting railroad cars on the spur track below.

• This tractor loader is another recent installation at the Tracy operations. Here it is loading the feed hopper at the asphalt plant.

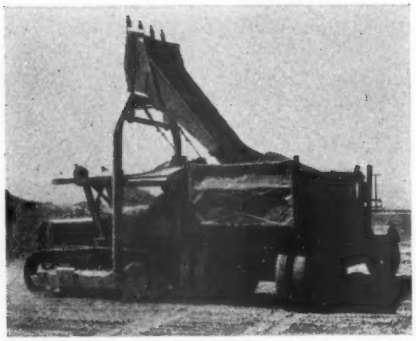
• The hot-plant is of the continuous type; it has a capacity of 60 tons per hour.

plant, processing consisting merely of running the material over a Simplicity 4- by 10-ft. screen, the rejects from which pass to a 2-ft. Symons standard cone crusher. The crusher is in closed circuit with the feed to the screen, the mesh of which is frequently shifted from 1½ to 1¼, 1, or ¾-inch, depending upon the specifications of the road material. Clay and silt, washed out at the aggregates plant, are retained in the road mix as desirable binder ingredients. The screen throughs are the finished product, a conveyor carrying them to a surge bin. The blended mixture is fed onto another conveyor which loads railroad cars on the spur track alongside. A tractor is utilized to pull the cars along the track while they are being loaded.

The roll-crusher plant unit, as previously mentioned, operates on washed gravel trucked over from the aggregates plant. It is equipped with a pair of 40- by 22-in. Pioneer rolls and a 3- by 10-ft. Diamond single-deck screen carrying ½-in. mesh. Practically all the output is asphalt-plant fines and much of it is used on the premises at the fifth and final plant on the Tracy Company's property. This is a Barber-Greene hot-mix asphalt plant of the continuous type, complete with drier and having a capacity of 60 t. p. h. Material trucked over from the roll-crusher plant is loaded into the bituminous plant feed hopper by a Hough Pay-Loader. The asphaltic material is used both for new highway construction and in the California Highway Department's maintenance program.

Water for washing and other plant needs is at present pumped from a nearby irrigation canal, but to assure a more constant supply the company is sinking a 12-in. well on the property which will extend about 500 ft. in depth, or well below the water table. The demand at the plant is for 1,000 g.p.m., and the new well will assure plenty of water at all times. Considerable water is used, incidentally, in wetting down the network of roadways which link the pit and the various plant units. A tank-truck sprinkler is constantly at work keeping these roadways damp and dust-free. This, Mr. French believes, is of benefit not only by making the rolling equipment last longer but is appreciated by neighboring ranchers and other property owners, who would naturally object to the dusty atmosphere which would certainly exist otherwise.

Dave Holden is superintendent of



• Trucks are quickly loaded at the stockpiles by this new loader.

construction at the plant, Stan Willey is his assistant, and A. R. Torrey serves as engineer of tests and liaison man between producer and consumer. Mr. Torrey has had a long and varied career in the aggregates and allied industries. During the decade preceding World War II he served in an engineering capacity among the various plants of Pacific Coast Aggregates of San Francisco. Early in 1941 he went to the Hawaiian Islands, where, until late in 1943, he was in charge of five concrete-batching plants operated by Ready Mixed Concrete Company, Ltd., of Honolulu, which produced 50,000 cu. yards of concrete under his supervision for defense installations.

Mr. Torrey well recalls the morning of December 7, 1941, when, while leafing through his latest copy of PIT AND QUARRY and eating a leisurely Sunday morning breakfast, the Japs suddenly let loose their rain of bombs on the fleet lying at anchor in Pearl Harbor. He carried on his work at the concrete plants, however, until the job was completed, returning to the mainland nearly two years later to rejoin his family in California.

Safety Council

(*From page* 92)

management's production practices since management is in a position to cope with safety problems and enforce safety practices.

The Thursday afternoon meeting was opened by the presentation of a plaque to the retiring chairman, Mr. Norvig. J. F. Buffington, New York Trap Rock Corp. and newly elected chairman of the section, made the presentation in behalf of the section members. Mr. Buffington introduced L. M. Funderburg, vice-president, Universal Atlas Cement Co., N. Y., as the first speaker of the meeting.

The theme of Mr. Funderburg's discussion, "If the boss has no interest in a plant safety program, it might just as well be thrown out the window," was his way of explaining his belief that responsibility for an accident prevention plan falls directly on management. "The degree of success of an accident prevention program," Mr. Funderburg said, "is in direct proportion to the sincerity and aggressiveness of management in setting forth sound and clear-cut policies, together with continual and forceful administration."

Ivan LeGore, assistant manager, Accident Prevention Bureau, Portland Cement Assn., gave a report of observations of safety program results in the portland cement industry. This industry has shown a 90 percent reduction in the accident frequency rate though the severity of accidents has been reduced but slightly. The severity rate still presents an important problem to the cement industry. About 75 to 90 percent of the causes of the high severity rate are traceable to one or more of the following four causes: high places, moving machinery, electrical hazards, and railroad operating. Mr. LeGore added that accident prevention must be carried out by production line personnel, and the cooperation of all employees is essential to successfully execute an accident prevention program.

The final speaker for the 1946 meeting of the Cement and Quarry Section was G. G. Grieve, staff representative, National Safety Council, Chicago. Mr. Grieve discussed the work of the Council and explained the various services offered by it. The many publications prepared by the Council were displayed and described as were the lantern slide films which have been prepared for safety education in plants. In closing, Mr. Grieve stressed that it was the purpose of the Council to assist safety personnel or safety engineers in the development and execution of safety programs and that all inquiries pertaining to the cement and quarry industries should be directed to him at the Council's Chicago office.

Colombian Cement Firm Reports Increased Profits

Marmoles Y Cementos del Nare S. A. of Colombia announced a net profit of 210,983 pesos for the first six months of 1945, as compared with 181,868 pesos profit for the previous six-month period.

This industry has maintained a high level of production, although it is reported that Nare continues to find it difficult to transport its cement by railroad to Medellin, because of a shortage of freight cars. With the installation of new equipment on order in the United States, the daily production (estimated) will be 400 tons.

Removal or Prevention of Rotary Lime Kiln Slag Rings

By THERON C. TAYLER
Taylor Engineering Service
Detroit, Mich.

Practical Information On Operational Problems

another P and Q exclusive

SLAG rings build up in the hottest zone of all rotary lime and cement kilns. These consist primarily of compounds of lime, silica, alumina and magnesia, no one of which alone would melt or fuse at a temperature under 3100 deg F., but when combined have fusing temperatures of 2100 deg. to 3000 deg. F., the exact temperature being a function of the number and proportions of the various ingredients.

It is common practice to install in the hottest zone of a rotary kiln 70 percent alumina (Al_2O_3) brick, otherwise known as crystalline corundum. As a pure product this brick would melt at about 1920 deg. C. or 3490 deg. F. as shown on the Composition-Temperature Phase Equilibrium Diagrams. (See next page.) If we draw a line to represent the full range of reactions for CaO with pure 70 percent alumina brick, we find that when 50 percent CaO combines with the brick, a low melting point is reached of 1480 deg. C. or 2695 deg. F. Similar lines drawn to represent 40, 50, 60 and 80 percent alumina brick show that all other such bricks combine with CaO to give lower melting temperatures: even 80 percent alumina brick is inferior to the 70 percent.

When we start up a kiln newly lined with 70 percent alumina brick, and the inner surface of the lining reaches 2695 deg. F., melting takes place. Lime dust flows into the brick surface and to appreciable depth,—as deep as the temperature of 2695 deg. F. penetrates. The lime being available in unlimited amounts, more than 50 percent CaO penetrates the brick, and the melting temperature rises, and the crystalline structure again becomes solid, a dicalcium silicate. It is common to develop a lining coating ¼ to ¾-inch thick measured below the original lining surface. It is common to lose this protective coating if the flame temperature changes excessively. This coating having a higher melting temperature than 2695 deg. is desirable and, if once acquired, should be retained.

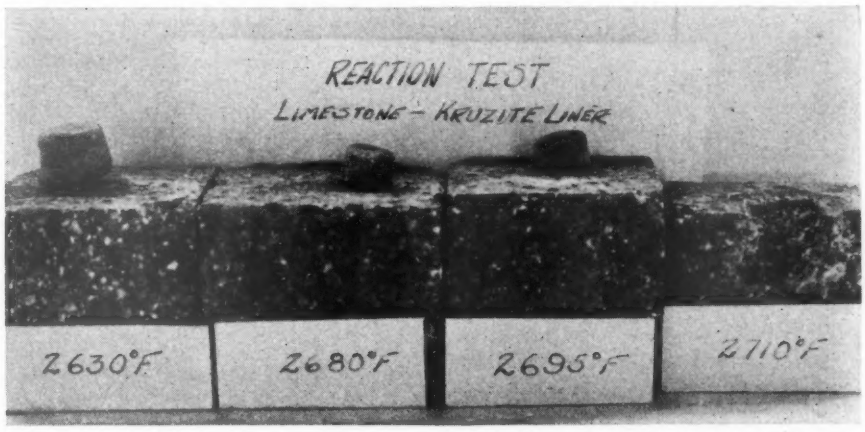
The accompanying photograph illustrates how a pellet of lime placed upon a 70 percent Al_2O_3 brick and heated had no effect until 2695 deg. F. was reached, and between that temperature and 2710 deg. the reaction was complete. Since the brick was uniformly heated, the reaction was deep. Note how perfectly this test checked with the composition-temperature diagram.

Theron C. Tayler

When burning fuels which contain no silica or alumina, such as gas, oil or petroleum coke, the ring build-up is frequently not so serious as to restrict the flow of stone and lime through the kiln. In that case we have only the silica, alumina and magnesia of the lime to combine, and the percentage of CaO and MgO is usually so high that the melting temperature is above the highest flame temperature, so ring build-up ceases with the initial fluxing of the brick surface, or if it builds beyond this, the bond becomes weak and it chalks off as fast as it builds.

Frequently the limestone fed into the kiln contains dust from clay or sand residue from a poorly-removed overburden, or which was windblown into the kiln stone. A rather insignificant amount of such dust can bring a high percent of silica or alumina into contact with the kiln lining. This dust may have entered as a mud coating on wet stone and became dust only when heated and tumbled. If the fuel contains no silica or alumina and the ring formation is rapid or builds up to restrict flow of stone and lime through the kiln, one obvious answer lies in cleaning the stone by either washing or by drying and screening. A study of the equilibrium diagram discloses that it might also be feasible to change to a lower-silica-content brick.

Powdered coal is our most common fuel. Even the best coal contains much ash. The ash always contains silica and alumina and always in a ratio of less than 70 percent alumina. The ash is usually heated to melting temperature. The brick or ring surface may also be maintained at melting temperature. The molten ash sticks to the molten surface. The conditions are ideal for a high rate of build up. The rate of build up can be affected to some extent by fuel selection and the fineness of pulverizing, but as long as we burn at temperatures close to the



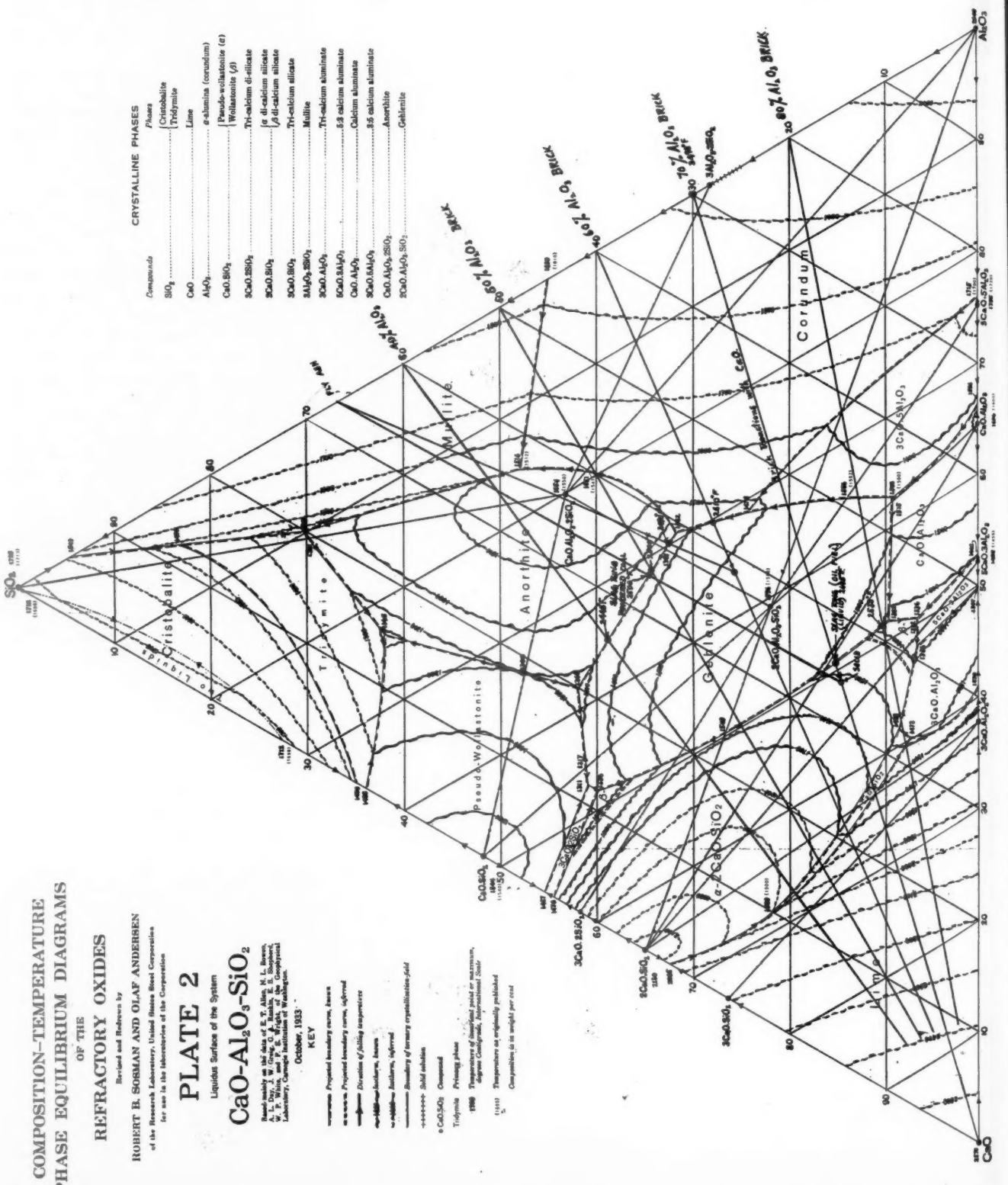
• Kruzite 70 percent alumina bricks heated in contact with CaO to reaction temperature.

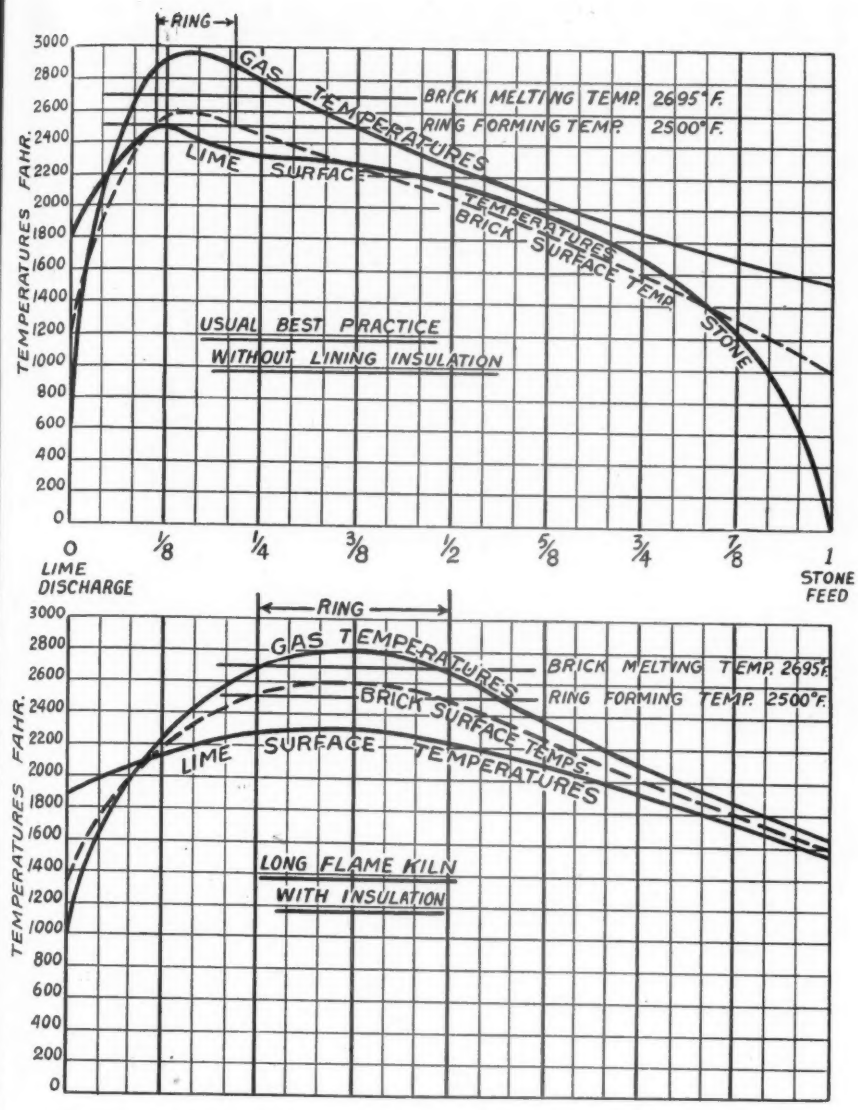
melting point of the brick and ash combination, we will have rings.

Rings may cover a long or a short zone depending primarily upon the length of the flame. A short intense flame will give a deep ring close to the firing end of kiln. A long luminous flame will spread the ring over a greater area and prevent too rapid thickening.

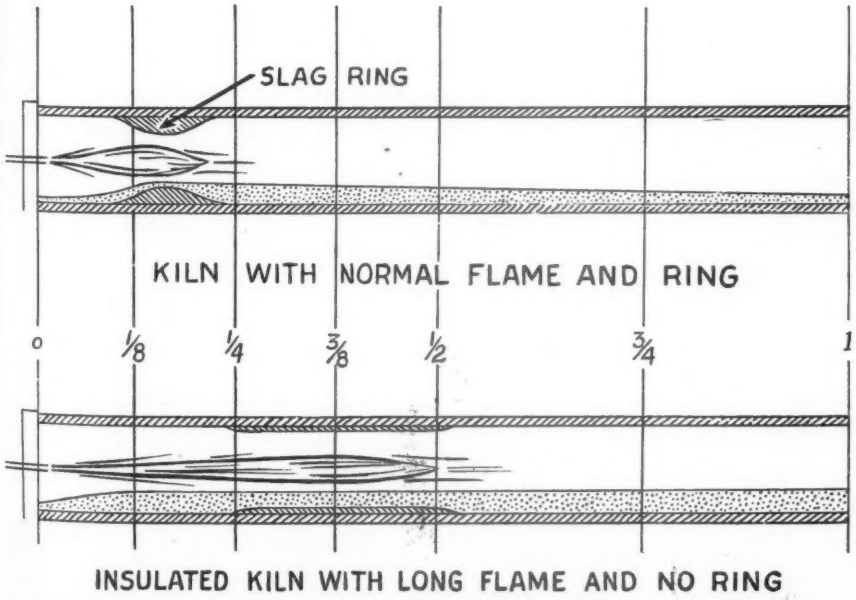
• Composition-temperature phase equilibrium diagrams.

As rings build up the flow of stone and lime through the kiln decreases; the kiln output steadily declines until it becomes uneconomical to keep the kiln in operation. Many expedients are then resorted to to remove the ring with the least possible loss of production. While some shut down, cool the kiln and remove the ring manually it is more common to use a water lance, a rifle or machine gun, or Cardox. Of these the latter is no doubt the most satisfactory method because it is quick, sure and removes the ring with a maximum of large pieces which can be separated from the lime with not too great difficulty. At best, we must lose much time—most serious is the gradual reduction in output for long before it becomes so serious as to require ring removal. There is loss of kiln output for the time it is down for ring removal. Then there





• Charts which show the best practice for kilns without (above) and with insulation.



• Horizontal sections showing (above) a kiln with a normal flame and ring and an insulated kiln with a long flame and no ring.

is the loss to lime damaged or contaminated by impurities added to it during the ring removal operation and for as long thereafter as required for all such impurities to be discharged. The cost of rings is considerable when we consider the labor and materials involved in removal, together with the loss of output before, during and after removal.

It is evident from the phase equilibrium diagram that it is silica that has the greatest effect on lowering melting temperatures. If we wash or screen the stone to remove silica and burn a fuel that is free from silica,—such as gas, oil or petroleum coke, we can expect to be free from ring trouble. The brick will take on a coating if heated to 2695 deg. F., but there will be no buildup to throttle flow of stone or lime through the kiln regardless of the temperature rise above 2695 deg.

The fly ash from powdered coal is largely silica and results in practically the same brick melting temperature of 2500 deg. F., whether the brick be 70, 60, or 50 percent Al_2O_3. Ring buildup can be prevented only by keeping surface of hottest brick below 2500 deg. F. This can be done by making a considerable drop in flame temperature, and omitting insulation from the hottest zone—a method not likely to be used because of the great sacrifice in kiln capacity caused by such drop in flame temperature.

The long flame kiln shown in the accompanying sketch was developed not to cure ring troubles, but to get high kiln output combined with a quality product. How we get the long flame and other desirable characteristics, the kiln accessories and controls, are all matters apart from this article on kiln rings. It is hardly true to say that it results in elimination of kiln rings; it would be better to say that it puts them under control.

The long-flame kiln makes it possible to get greater capacity with lower maximum flame temperatures, but not enough lower to eliminate ring formation. What it has done as respects ring formation is to lengthen the zone of ring formation to about 2½ times the usual length. The buildup is thus deposited over 2½ times the brick area and theoretically it would take four times as long to build to the same depth. Actually since we have 2½ times as much surface exposed to the wearing effect of the sliding and rolling

(*Continued on page* 101)

NEW EQUIPMENT AND ALTERED PLANT FLOW SOLVE SERIOUS PRODUCTION PROBLEMS

another ON THE SPOT report

THE Pine Creek Lime & Stone Company, located at Jersey Shore, Pa., about 16 miles west of Williamsport, in April of this year made important changes in its plant in an effort to relieve a serious bottleneck which had been impeding production. The stone processed at this plant is exceptionally hard, and contains a high percentage of chert, a flint-like rock which almost invariably causes trouble in crushing operations. A gyratory crusher, the second of several crushing units in the flow, was unable to take the material fast enough to keep the plant in balance, and as a result production lagged rather seriously.

By WILLIAM M. AVERY

The company became interested in the possible application of the Ebersol 2-stage jaw crusher as a solution to its difficulties, and ultimately placed an order for the first 9- by 40-in. model of the machine ever built. The gyratory crusher and a 10- by 30-inch roll crusher were accordingly removed from the flow and replaced with the 2-stage unit.

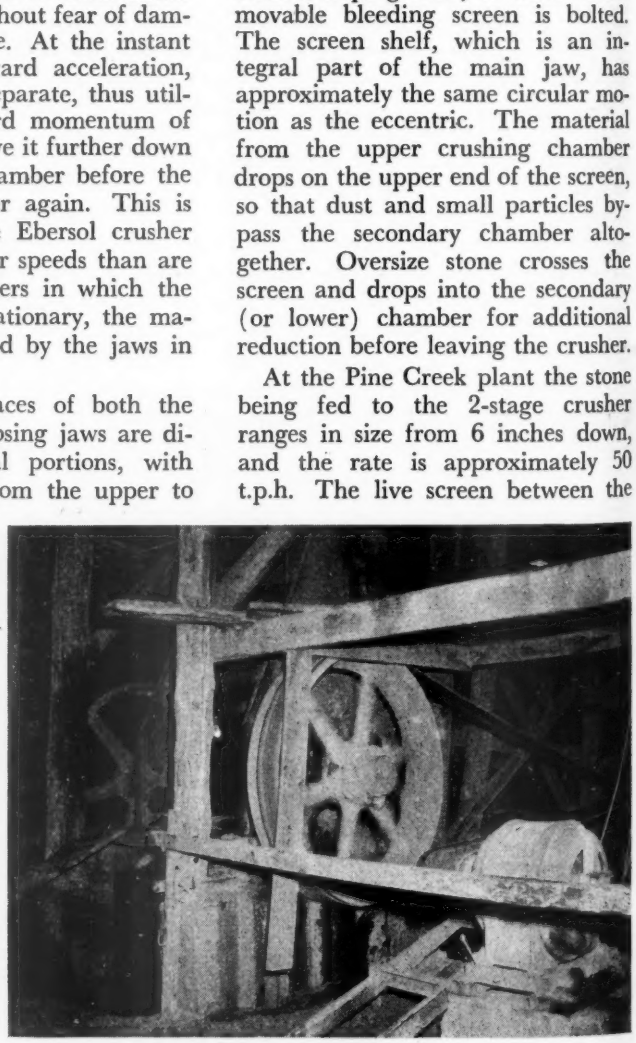
In the Ebersol 2-stage crusher the main jaw has a rotary movement while the opposing jaw moves vertically only. This action, by forcibly propelling the stone downward as it is being crushed, tends to prevent bridging, and is said to make choke feeding possible without fear of damage to the machine. At the instant of greatest downward acceleration, the jaws start to separate, thus utilizing the downward momentum of the material to move it further down in the crushing chamber before the jaws come together again. This is said to enable the Ebersol crusher to operate at higher speeds than are practical for crushers in which the opposing jaw is stationary, the material being released by the jaws in a state of rest.

The crushing faces of both the main and the opposing jaws are divided into vertical portions, with the lower offset from the upper to form a sloping shelf, to which a removable bleeding screen is bolted. The screen shelf, which is an integral part of the main jaw, has approximately the same circular motion as the eccentric. The material from the upper crushing chamber drops on the upper end of the screen, so that dust and small particles bypass the secondary chamber altogether. Oversize stone crosses the screen and drops into the secondary (or lower) chamber for additional reduction before leaving the crusher.

At the Pine Creek plant the stone being fed to the 2-stage crusher ranges in size from 6 inches down, and the rate is approximately 50 t.p.h. The live screen between the

• A general view of the Pine Creek Lime & Stone Company's crushing plant at Jersey Shore, Pa., where recent improvements have effected a 25 percent increase in production.

• Below, left: The new two-stage 9- by 40-in. jaw crusher, which is reducing minus 6-in. stone to minus 1½-in. at the rate of about 50 t.p.h.



• Right: An apron feeder will soon replace the present gravity feed on this 22- by 48-in. primary jaw crusher.

• Left: The final stage of crushing is accomplished through this 16- by 16-in. set of rolls.

• Right: About 20 percent of the total output is pulverized and marketed as agricultural limestone. Note the horizontal disk-type table feeder behind the mill.

primary and secondary jaws of the crusher measures 11 inches by 40 inches and contains 1-in. openings. About one-third of the feed is taken out between the upper and lower chambers, thus by-passing altogether the second crushing stage. The entire output of the crusher ranges from 1½-in. down to dust.

The new crusher has, in general, relieved the bottleneck problem, with the result that production has increased from 240 t.p.h. to more than 300 t.p.h. In addition, considerably better breakage is being obtained, and the product seems on the whole to be more cubical than formerly. These advantages are said to result from the relatively high speed at which the machine may be operated. In the present instance the fly wheel rotates at 440 r.p.m., with the result that the stone is being broken by impact rather than by pressure. The crusher is direct-connected by V-belts to a 75-hp. electric motor. In the near future the company plans to install a surge bin ahead of the 2-stage crusher, and to effect other changes which will make it possible to remove 1-in. stone from the flow before it passes through the Ebersol. These changes should bring about a further increase in the capacity of the plant.

As now constituted, the flow of materials through the plant is as follows. Stone is trucked from the quarry and discharged to a 22- by 48-in. Good Roads No. 20 jaw crusher. The material is elevated on an inclined belt conveyor and passes through a 6- by 16-foot rotary screen, in which eventually it is planned to remove the minus-1-in. fraction. At present the entire flow is chuted to the Ebersol crusher, and then re-elevated and passed through a 6- by 14-foot Kennedy-Van Saun rotary screen. Oversize from the rotary is rescreened on a 3- by 6-foot single-deck Simplicity vibrating screen, from which in turn the oversize is chuted to a 16- by 16-in. New Holland roll crusher. The rolls and the 2-stage jaw crusher discharge into the same bucket elevator to close the circuit. It will be noted that there is no flow back through the Ebersol crusher. The only important additional change now pending is the installation of a Telsmith apron feeder to feed the primary crusher.

About 20 percent of the output of the crushing plant, ranging from No. 1 screenings to 1½-inch stone, is trucked some 200 yards to a small pulverizing plant which is owned and operated by the Pine Creek concern. The trucks dump into a hopper, from which the stone is elevated to a bin. The pulverizer is a Bradley-Hercules Junior mill equipped with a horizontal disk-type feed table which cuts off automatically when the load on the mill drive rises to a predetermined level.

The mill product, which is marketed as agricultural limestone, is in the fineness range of 100 percent through 20-mesh and 66 percent through 100-mesh. The material is elevated and stored in a 250-ton bin to await shipment by truck. The company does not operate spreader trucks, and all sales are on the f.o.b. plant basis.

As its name would imply, Pine Creek Lime & Stone Company at one time burned and hydrated lime, but this end of the business was discontinued several years ago. The present company was incorporated in 1922, although quarries have been operated on the site for almost a century. Dr. Warren M. Shuman is president of the company. C. E. Peterson is plant manager and secretary-treasurer.

Critical Building Materials Show Steady Gains in 1946

Production of most key construction materials showed substantial increases during the first six months of 1946, as compared with the corresponding months of 1945, according to the Construction Division, Department of Commerce in its *Report on Construction and Construction Materials.*

Cement production in June totaled 14,489,000 barrels. This was a 19 percent increase over the output in May, 62 percent more than that for June, 1945, and the highest volume since November, 1942. The output for the first half of this year—69,600,000 barrels—showed a gain of 64 percent over that for the corresponding period of 1945, and of 14 percent over that for the last six months of 1945. June shipments exceeded production by less than 1 percent. This was the first month in 1946 in which stocks were not heavily depleted.

Shipments of gypsum board and lath during the second quarter of 1946 totaled 725,000,000 square feet—slightly higher than the average quarterly rate in the previous peak year, 1941. With resumption of activities at a plant affected by work stoppages in May and June, it is expected that the industry can attain an all-time annual peak of 2,950,000,000 square feet. Lath shipments for the second quarter totaled 282,000,000 square feet, accounting for approximately 39 percent of total shipments. The average current output of gypsum board and lath is about equal to new orders.

Although production of concrete building block is reported to have increased each month since the first of this year, as a result of expanding machine capacity, the output continues inadequate to meet the demand.

Kiln Rings

(*From page* 99)

load, the buildup is further slowed. Combine this with a little care in selection of fuel, ample means for eliminating SiO_2 (sand) from the raw stone, and suitable flame control and ring formation can become so slow as to be eliminated as a problem and may even become rated as a desirable means for extending the life of the lining.

The composition-temperature equilibrium diagram, one of a set prepared by Robert B. Sosman and Olaf Anderson, is published by permission of the United States Steel Corporation. The Fahrenheit temperatures and lines for brick and ash reactions have been added by the author of this paper. Larger copies of this diagram in color are obtainable at a nominal price from the U. S. Steel Corp. The several lines for brick and ash can be added without difficulty.

THE LIME PLANT OPERATOR

BY WOLF G. BAUER

FAN TECHNOLOGY
PART III—Design, Application, Control

Wolf G. Bauer

IN Part II of this series of articles on fan engineering we classified centrifugal fan wheels into three major classes according to the radial inclination of the blade tips. There are further structural features and modifications which are a function of the fan application. In such a short and generalized treatise as this, space does not permit describing all the various wheels and their structural features. However, since the so-called planing mill exhauster is applicable to the greatest variety of jobs around a lime plant, we shall concentrate on it.

This exhauster, which is also well suited for blower work around fifteen inches pressure (Class IV), was originally built and designed to handle waste materials like sawdust, shavings, etc. For such purposes an open-type, straight-bladed, six-spoked wheel in a steel, single-inlet housing has been found most satisfactory. Usually the spider is cast iron, the hub being keyed to the fan shaft. Structural steel arms are fitted onto or into the cast spider, and blades of various shapes are attached to these arms. Generous clearance between wheel and housing are usually maintained.

The wheel may also be shrouded or rimmed on each side with a straight or tapered flange. This rim helps to strengthen the wheel, and allows incorporation of a greater number of blades. This construction is more generally applied to high-pressure turbo-blowers where these factors make for greater efficiencies. When gases are highly charged with abrasive dust or solids, the open-type radial wheel is preferred, as there are fewer pockets and opportunities for localized erosion.

A distinction in wheels is also made in the matter of speed. A so-called slow-speed wheel is larger in diameter, and usually has more blades. Let us remember that fan pressure is not a function of relative shaft speed, but a function only of blade tip or peripheral speed. It is obvious that for the same pressure developed, a wheel of large diameter may revolve at lower shaft speed than one of smaller diameter. Fans or blowers for high-pressure applications above one pound of pressure are usually outfitted with wheels of large diameter, multi-bladed forward-curved blading, and reduced-diameter shaft journals in order to hold bearing speeds to a minimum.

Fans may have several specific speeds of vibration due to a number of conditions. Most of this vibration is a result of faulty assembly, installation, balancing, base, drive, etc. There is also an inherent vibration condition which occurs at the first critical speed at which vibration is set up due to shaft deflection between or from bearings. High-speed fans are therefore designed with heavier shafting through the wheel hub for stiffening reasons, as well as keeping bearing speeds of the journals as low as possible. Fans must not only be operated below or above this speed, but also below a certain safe speed above which the centrifugal force exerts unsafe tensile loading upon the wheel. This point is of particular interest in high-temperature exhaust work due to the fact that the tensile strength of some steels diminish rapidly above 1,000 deg. F. temperatures. Most fan tables give maximum safe fan speeds, but this should always be checked when higher-than-normal temperatures are encountered.

High Temperature Fans Fans for handling hot gases, and some fans are being operated up to 1,600 deg. F., are made of heat-resisting alloys. When dealing with centrifugal forces, one cannot simply add strength by increasing metal thickness, as this increase in weight adds to the forces. More recent metallurgical experience with gas turbines and aircraft exhaust super-chargers have yielded data which will boost the temperature range of fan work, and will no

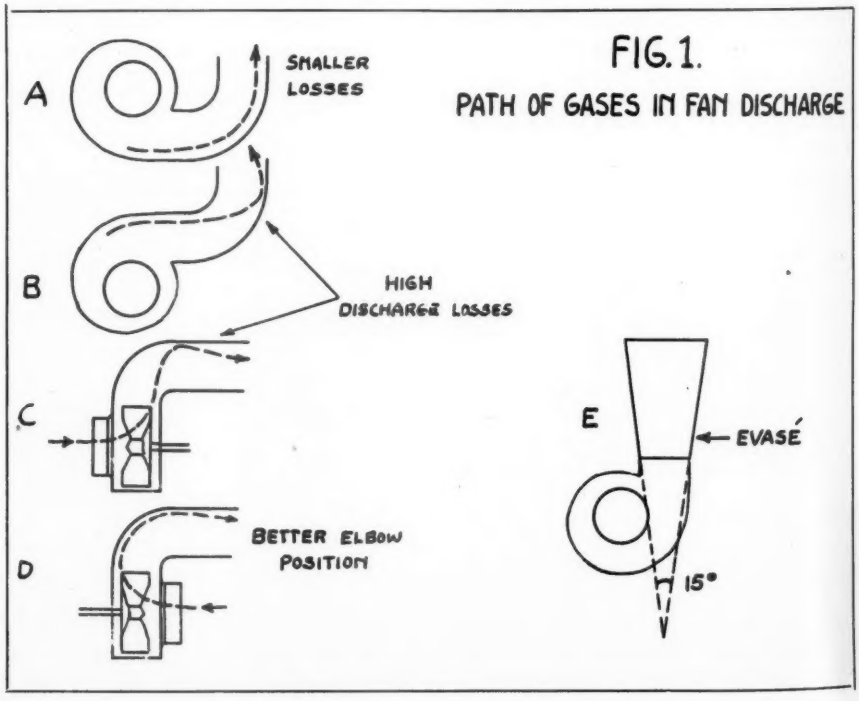
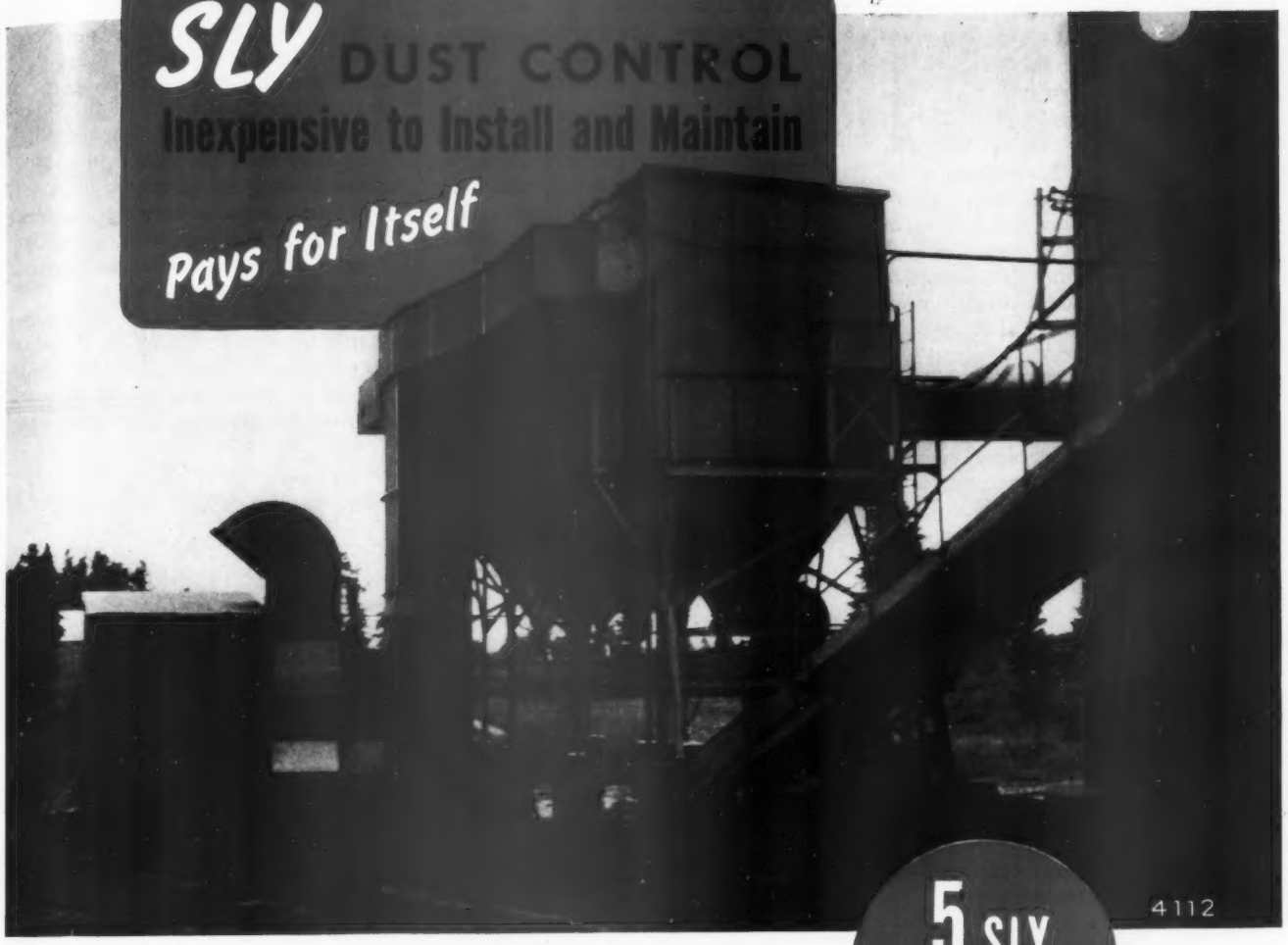


FIG. 1.
PATH OF GASES IN FAN DISCHARGE

SLY DUST CONTROL
Inexpensive to Install and Maintain
Pays for Itself



Sly Dust Filter used in connection with the crushing plant of the Staso Milling Co., Kremlin, Wis., manufacturers of roofing granules.

Sly Systems are widely used to control dust generated in such operations as crushing, grinding, screening, conveying, loading, separating, and mixing—in connection with production of cement, crushed stone, agricultural limestone, gypsum, asbestos, talc, feldspar, fluorspar, gold, copper and iron ore, diatomaceous earth, bauxite, etc.

These units are not expensive either to install or maintain. They save thousands of dollars yearly in plant maintenance and improved production, also in the recovery of valuable materials—often repaying their cost in a comparatively short time.

Ask for Bulletin 98, a 20-page illustrated publication giving important information about dust control and the advantages of the Sly method.

Sly Dust Collectors are different—they get all the dust by filtration through cloth. Over 5,000 installations.

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doubt result in power savings in hot gas exhaust applications.

Aside from special alloys, fan manufacturers usually specify heavier shafts, high-duty bearings, as well as heat-dissipating aids such as shaft heat flingers, and water- or air-cooled bearings. Maintenance of safe oil or grease viscosity is, of course, one of the critical factors in hot fan operation. In some aircraft turbo-blowers, the hot bearings are supplied, for instance, with heavy oil circulation by an integral oil pump, which helps to carry heat from the shaft and bearings. Babbited plain bearings are used when bearing housing is water-cooled. Satisfactory operation with this cooling device hinges on a supply of clean water at constant pressure and volume, lines which will not freeze or plug, and provisions either visible or automatic to indicate any variations in bearing temperatures.

Heat may also be conducted from the fan shaft by heat-flingers, or small fan blades arranged to blow or pull cool air over the bearing housing. Ball bearings are air-cooled rather than water-cooled. The writer has mounted axial blades on spoked-drive pulleys to blow cool air over the inboard bearing on ordinary type exhausters operating at up to 900 deg. F. gas temperatures. In such installations where cold air dilution is either necessary or not detrimental, the fan itself may be made to pull cold air over the hottest bearing, and over cooling fins attached to the shaft. A removable duct or shield around the bearing to the fan inlet, at the point where the shaft enters the housing, concentrates maximum convection upon the bearing.

Heat flingers are generally small cast iron wheels with some blading that tend to dissipate shaft heat by conduction and convection. They are placed between fan and first bearing. Generally they are not built along very efficient lines. For temperatures above 1,000 deg. F. they should be of aluminum or other highly-conductive metal, and be designed with a wide hub for maximum shaft contact, and a large number of thin blades or fins set at such angle as to pass cold air through them toward the fan. The side of the fan housing should be insulated to stop radiation effects toward heat flinger, bearings, and belts or motor.

In all high-temperature work, fans must be adequately protected against critical temperatures, i.e. critical to either bearings or fan wheel, or both. Thermobulbs, actuating signals or controlling cooling air dampers can be installed on either the fan bearings, or the gas inlet duct. For gas temperatures above 700 deg. F., thermocouples are generally required. Such couples should not be encased in heavy wells in order to retain high couple sensitivity. Where several hot fans are to be protected from a central pyrometer, such a system must be designed for minimum lag, and shortest consecutive switching-in of couples. Electronic, non-balancing type pyrometers should be given preference for such applications because of their greater signal speed.

Conveyor Fans Fans which are operated as ground lime or limestone conveyors are subject to wear from material abrasion both in the housing and blading. Judging from reports by operators who have tried it, blades in such fans may be built up, repaired, or reinforced with ordinary ribbed floor plate. By cutting uniform plates to fit over wheel blades in the area of wear, such liners may be riveted and then seam-welded on. Such ribbed plates must be oriented so that the long axis of the projections or grooves are parallel to the fan shaft direction in order to obtain the peculiar wear-resisting quality of such liners. The use of axial-flow damper or vane control has tended to eliminate blade abrasion to considerable degree, but somewhat at the expense of the vanes themselves. Since these, however, are easier to repair and not in need of balancing, fan inlet flow vanes of either fixed or movable type are an advantage for this application.

High Pressure Fans Since there are, at present, rather limited applications of high-pressure blowers or fans (over one pound per square inch or 27 inches water) in lime plants, these machines will warrant only a brief description. This type is used for gas injection purposes, kiln or dryer burners, pneumatic conveyors for lime and ash handling, special dust-collecting systems and aerating or carbonating systems for milk of lime, etc.

There are two ways of obtaining higher gas pressures from fans and blowers, either by increasing fan speeds, or arranging fans in series for additive pressures, i.e. connecting the discharge of one fan to the inlet of another.

In the first case, higher blade tip speeds are necessary, and this higher velocity pressure resulting from such tip velocity must be efficiently converted to static pressure. This is accomplished by incorporating a "diffusor" zone into the casing, in order to achieve a gradual change of pressure with minimum shock or energy losses. In the ordinary fans, these losses are dissipated in the form of heat, hence they operate at a lower conversion efficiency. The diffusion zone may take the shape of a laterally-widening spiral scroll, or a narrow annular space between the blade tips and the true volute of the casing. Wheels are generally larger in diameter, have narrower and more blading, and may have spiral inlet vanes to rotate incoming gas in direction of rotation of fan. Pressure limits are set by maximum tensile strength of wheel at maximum speeds.

Two or more fans connected in series may, of course, be used in certain cases. However, the principle of this technique is employed more efficiently in the inherent design of multi-stage turbine blowers, each stage functioning as a separate fan in series, adding its pressure to the foregoing stage. Where speed is limited, the addition of stages is the best expedient for higher pressures.

Fan Drive Selection Aside from the pressure characteristics of different wheels already discussed in Part II, the type of drive may also have a bearing on the wheel and fan design, as some manufacturers put out fans especially designed to be driven by either high-speed motors or turbines, as well as slower-speed pulley drive. Higher speeds allow the use of lower-cost high-speed motors. With the introduction of the gas turbine, this motive power should have many advantages due to its simple speed regulation, resulting in proportional power consumption.

As far as general fan applications are concerned, however, fans are best driven through V-belt drives, so that changes in speed may be accomplished with little expenditure by merely changing size of pulley. With such drive, care must be taken not to let radiant heat from hot fans, etc., overheat the belts above 125 deg. F. Five thousand-feet-per-minute belt speeds are usually taken as the safe upper limit, and pulley wrap must be at least 130 degrees with small sheaves. Manufacturers should be consulted for such data, so that correct pulley sizes can be applied.

Fan Control and Power Conservation Figure I gives us a chance to look into the fan and connections, and observe the path of gases into and out of the fan. It should be quite plain from these sketches that there are correct and incorrect ways

All Point Efficiency with SINCLAIR SPECIALIZED LUBRICANTS

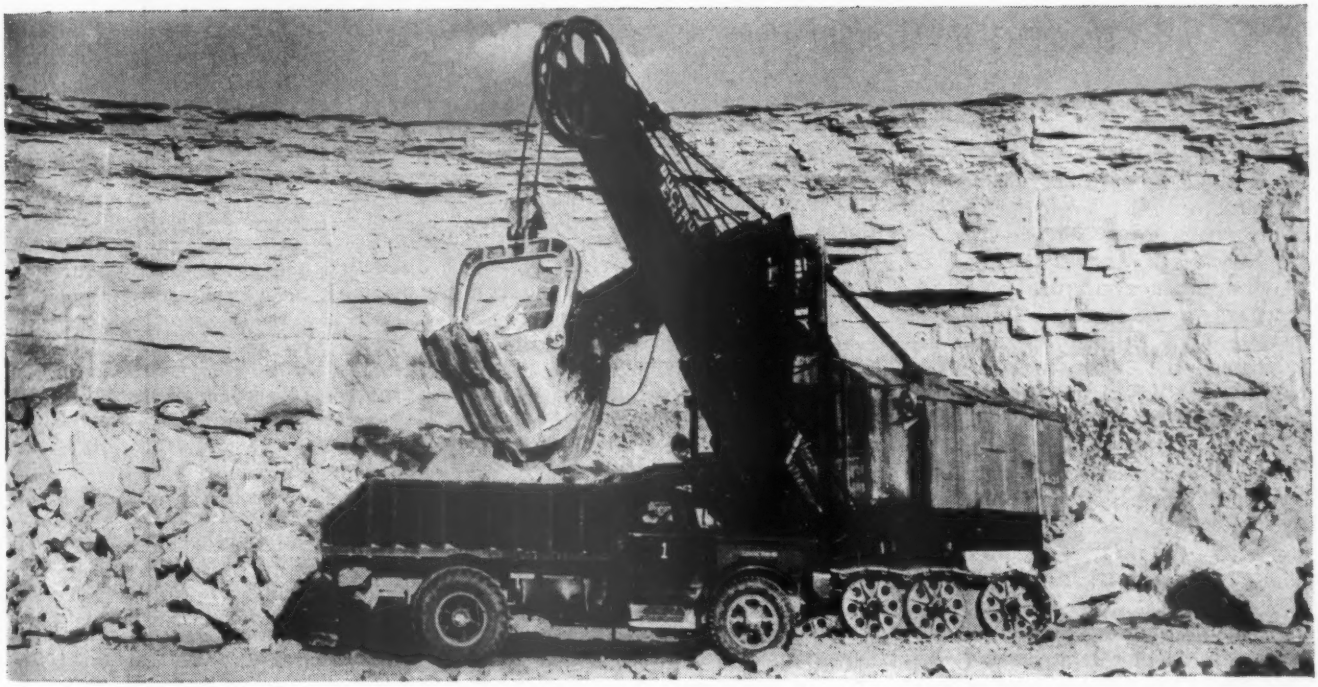

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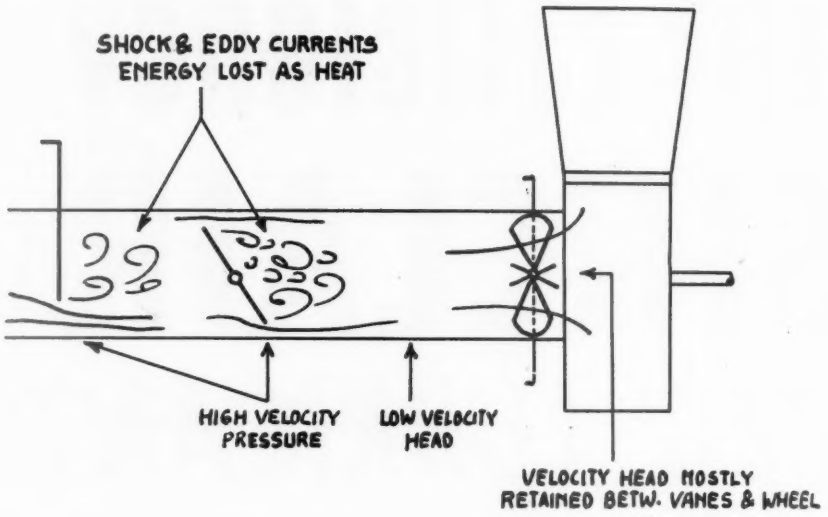
FIG. 2



DAMPER VS. VANE CONTROL

of locating elbows or bends to fans. When the fan discharges its gases to the atmosphere, a flared stack (evasé) is employed for the purpose of minimizing back pressure. Generally this is tapered at an angle of 7½ degrees as shown in Fig. 1-E. In view of the concentration of gas pressure in one corner of the evasé instead of a uniform pressure distribution, the correctness of the symmetrical discharge duct appears questionable to the writer.

Most operators probably think of fan control in the form of a straight-bladed damper blade pivoted on a shaft through its center, or a sliding blast gate, the position of the damper or gate handle constituting a guide to gas control. The drawbacks of such regulation means have already been pointed out in an earlier article. There is a further disadvantage in this type of damper, and that is power loss. It is the cheapest and simplest method, but also the most inefficient and inaccurate one. The larger the installation, the more serious the resulting energy losses. Figure II indicates where these losses occur.

There are several ways of controlling gas volume or pressure, as well as weight of gas delivered by a fan. To do this with minimum energy loss requires fan speed variation to suit volume and pressure requirements, since power is more or less proportional to gas mass handled. Speed regulation may be obtained through variable-speed pulleys or motors such as the slip-ring type, although with the latter the operating efficiencies drop with lower load demands. Dual motors, or two-speed motors with double windings may also be used in combination with dampers for lower power consumption.

Fluid coupling may be employed to good advantage. With fluid drive the efficiency of the drive system reduces directly with the amount of slip in the coupling. However, this loss is more than offset by the fact that power, varying as the cube of resistance, is expended at a lower rate when gas resistance is reduced, with resulting lower fan speed due to coupling slippage.

In efficiency somewhere between these two methods and that of ordinary damper control, the so-called vane control at fan inlet may be employed. Whereas the constricting effect of a partly-closed damper creates high velocity pressure through the damper area, this velocity energy is again partly lost below the damper in eddies and heat. See Figure II-a. In installations where dampering can be applied directly at the fan inlet, the velocity head due to constriction can be given such directional force as to lower the entry losses into the fan wheel, losses which are caused by the inertia from straight flow to right angle rotational flow through the inlet. This is accomplished by placing adjustable radial guide vanes or blades into or around the fan-inlet duct opening. They are more easily applied to air blowers than to closed-inlet duct exhausters. Such vanes will steepen the pressure characteristics curve of all fans to which attached.

There is no doubt that fan speed regulation is the most efficient method of varying fan output, but this method also usually represents the greatest initial investment. It is therefore primarily of interest where large and fluctuating power demands exist. Fluid couplings and vane control are intermediate in effect and cost, while straight dampers are lowest.

Gas weight control as compared to gas volume control has already been discussed in former articles on kiln control. In these it was shown how differential pressures measured across orifices and constrictions, as well as deflection positions of impact vanes, should be used for indicating and/or controlling gas flow by mass effect. Since there is a fairly close relationship between weight of gases moved by a fan to the power or current drawn by the fan motor, this fact can be exploited for control purposes. It remains only to attach an ammeter to the motor, one which is fitted with electrical contacts, and which are adjustable. Such an ammeter can then act as an indicating or regulating device for manual or automatic damper adjustments to hold motor current constant. This, in effect, would then provide automatic gas-weight or gas-pressure regulation.

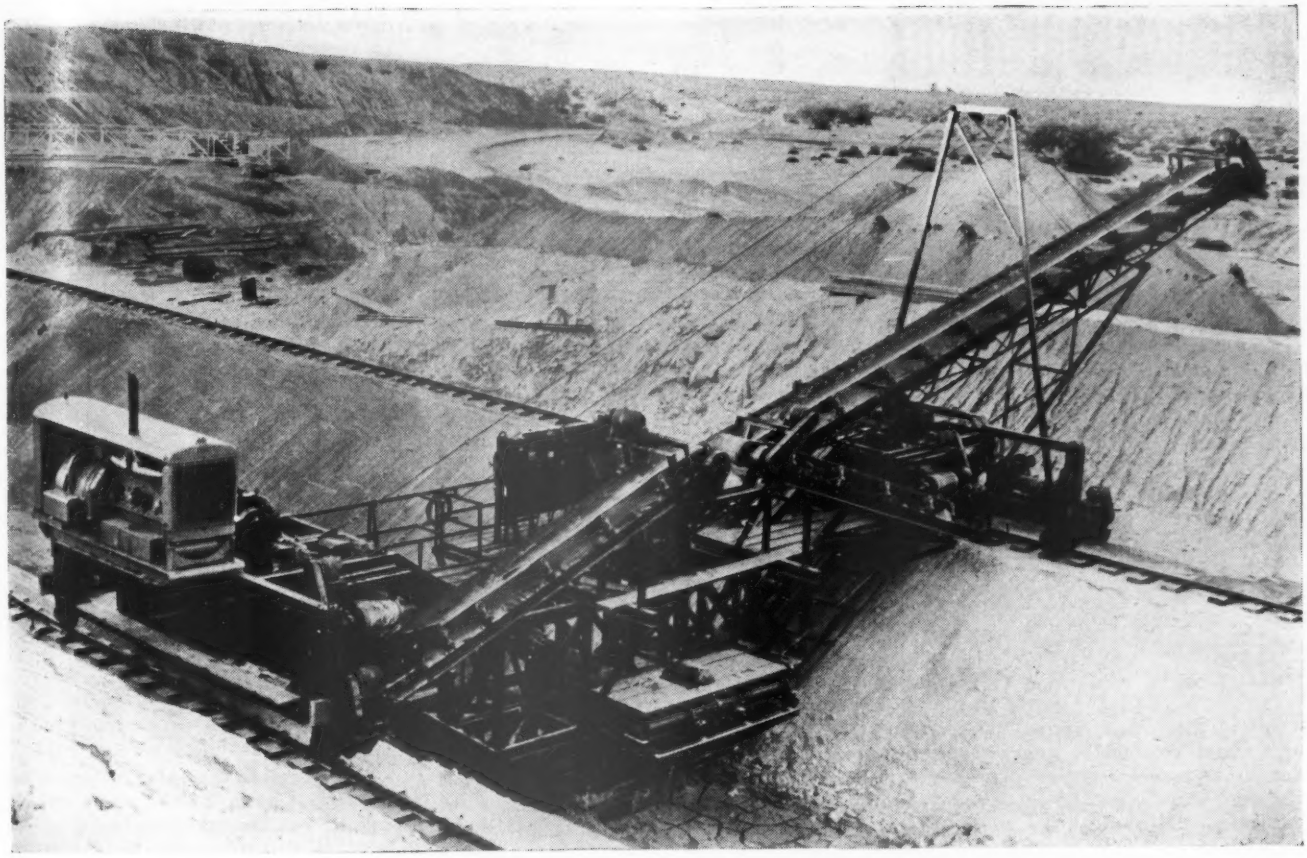
Potts Sand & Gravel Co. Installs New Grading Plant

The Potts Sand and Gravel Co. at Casper, Wyoming, has completed a new grading plant, using gravel screens and high-pitch vibrators, gravel washers and powerful rock crushers which can turn out any desired size of aggregate. Offices of the firm are in Casper, and the plant is located southwest of the city. Tractors and tractor shovels are used to dig gravel at high speed, giving high production at reduced cost per unit.

The company was founded by R. F. Potts 27 years ago and has been a pioneer in the sand and gravel business in the Casper area. It is still operated by the Potts family.

At the Eastwood Sand & Gravel Works near Grayville, Illinois, a barge and other equipment were damaged to the extent of $6,000 when a large stationary crane fell on the vessel. A supporting timber was said to have broken, causing the crane to topple over on the barge as it started to lift a dipper of gravel during unloading operations. None of the boat's personnel was injured.

The Hallet & Oberg sand-and-gravel plant near Slayton, Minnesota, newly built at a cost of $40,000, has been placed in full production. Designed by E. F. Oberg, a partner of the firm, the plant has been equipped for 24-hour service.



Power from a MURPHY DIESEL ME-6, 100 KW Generator Set, generates current for all the electric motors that operate the big canal sub-grader shown here, while also powering a 5 KW Transformer to provide lights for night work on the project. This unique machine is turning the last 8 to 10 inches of material from a canal in Southern California, bringing it to grade for concrete lining . . . another example of MURPHY DIESEL versatility.

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Murphy Diesel powered rock crushers, for instance . . . and gravel plants, excavators, hoists, pumps, locomotives, lumber and logging plants, mining equipment, oil drilling rigs, work boats, and other standard heavy-duty equipment . . . have won wide acceptance among users who value dependability above all else in power units.

On many specially designed machines, too, like the big canal sub-grader shown above, MURPHY DIESELS contribute much to successful performance. Rugged; compact; easy to start in any weather; reliable performance; and economy in operation and maintenance, are reasons why heavy duty equipment new or old, powered by MURPHY DIESEL, can be depended upon for more power, more profit.

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PERSONAL MENTION

Stanton Walker

STANTON WALKER, consulting engineer with the National Industrial Sand Association, Washington, D. C., has been appointed to the sand division grading and fineness committee of the American Foundrymen's Association.

Mr. Walker is also directing engineer of the National Sand and Gravel Association and of the National Ready Mixed Concrete Association.

MAX C. SCHERLE has accepted a position as superintendent of the Geneva Steel Company's stone quarries at Provo, U.

JOHN R. REENAN, formerly associated with the Aluminum Ore Company of St. Louis, has accepted a position as assistant superintendent of the fluorspar division of the U. S. Coal and Coke Company at Mexico, Ky.

RAYMOND B. LADOO, an authority on nonmetallic minerals, studied the possibilities of establishing an artificial abrasives manufacturing industry in the Portland, Ore., area during the past summer. Mr. Ladoo has also been active on special projects in this region for the Aluminum Company of America. He was formerly a consultant for the Pacific Power and Light Company.

W. W. BRADLEY, who has been California's state mineralogist for the last 18 years, has resigned from his duties to retire from active service. W. B. TUCKER, Los Angeles district mining engineer, has been appointed to fill the position temporarily. Mr. Bradley has served on the staff of the California Mining Bureau for the last 35 years.

E. E. ROUTH, vice-president of the Mathieson Alkali Works, Inc., New York City, has been elected chairman of the Industry Advisory Committee for the Chlorine-alkalies industry, the Office of Price Administration has announced.

C. R. FAY, Pittsburgh Plate Glass Company, Pittsburgh, and W. A. CRICHLEY, Diamond Alkali Company, also of Pittsburgh, have been elected vice-chairman and secretary, respectively.

Also on the committee are the following: GEORGE SCHWARZ, Wyandotte Chemical Company, Detroit; BEN STEELE, vice-president, Pennsylvania Salt Company, Philadelphia; DANIEL TOWNSEND, vice-president, Fields Point Manufacturing Company, Providence, Rhode Island; and LOUIS NEUBERT, vice-president, Westvaco Chlorine Products Company, New York City.

BENNETT M. SAUNDERS has been appointed field engineer for the Seattle district offices of the Portland Cement Association. During World War II Mr. Saunders served as captain with the 41st Division in Australia and the South Pacific.

H. BRUCE WILSON was recently appointed manager of industrial relations for the Pittsburgh Limestone Corporation of the United States Steel Company, according to an announcement made by A. W. Worthington, president.

Also appointed to new positions were HENRY B. BALTZERSEN, comptroller and assistant secretary, and RAYMOND W. LONG, assistant comptroller.

A. E. KOTTINGER, proprietor of the Kottinger sand and gravel plant in Mount Shasta, Calif., has sold his business to John Jensen and M. N. Thompson. Mr. Kottinger has operated the plant for the last 22 years, having founded the company of Craft & Kottinger with his brother-in-law, whose interest he purchased several years ago.

E. T. Obenchain

EDGAR T. OBENCHAIN has joined the National Gypsum Company as director of purchases, according to announcement made by Melvin H. Baker, president. His appointment fills the vacancy left by the recent death of Harold Drake, who had been in charge of the purchasing department almost since the organization of the company.

Mr. Obenchain has had 12 years experience in the gypsum business, chiefly in purchasing work. He has also held the position of sales engineer for the Bucyrus Erie Company and the Owens Corning Fiberglass Corporation.

During World War II he served the United States Navy as Assistant Director of the Material Procurement Office, Bureau of Ships.

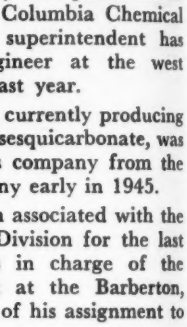
FRANK M. AFFLECK is a representative of the Universal Atlas Cement Company in Waterloo, Ia. Mr. Affleck served in the U. S. Navy during World War II.

The following appointments have been announced by Pacific Coast Aggregates: H. W. ESRY, sales manager of the Building Materials Division; FRANK McMULLEN, assistant manager of the Building Materials Division; RAY COYLE assistant sales manager of ready-mixed concrete; WARDWELL N. KOOSER, district sales manager for San Francisco; FRANK J. CAYTHING, district sales manager, Oakland; Fred Lyon, salesman, East Bay district.

The appointment of PHILLIP E. SHARR as superintendent of the Pittsburgh Plate Glass Company's alkali producing plant at Bartlett, Calif., has been announced by E. T. Asplundh, vice-president in charge of the firm's Columbia Chemical Division. The new superintendent has served as chief engineer at the west coast plant for the last year.

The Bartlett plant, currently producing soda ash and sodium sesquicarbonate, was acquired by the glass company from the Pacific Alkali Company early in 1945.

Mr. Sharr has been associated with the Columbia Chemical Division for the last nine years. He was in charge of the planning department at the Barberton, O., plant at the time of his assignment to the Bartlett plant.



J. L. Feagin

JOHN L. FEAGIN has been appointed district engineer in charge of a new district office opened by the Portland Cement Association at 22 N. Front Street, Memphis, Tenn.

Mr. Feagin will have charge of association activities in Arkansas and Tennessee. He joined the P.C.A. engineering staff in 1937 as field engineer in Alabama. From 1942 to 1945 he served with the U. S. Army in Europe and was released from active duty with the rank of lieutenant colonel.

RAYMOND MATTHEWS has been elected president of the Kentucky Stone Company of Louisville, Ky. Mr. Matthews succeeds WILEY BRYAN, who has served as president pro tem since the death of SAM PARKE BURNAM several months ago. Mr. Bryan will remain chairman of the board of directors.

G. J. FINK, a former research fellow, National Bureau of Standards, Washington, D. C., has been appointed executive secretary by the Oxychloride Cement Association, Inc. He will be located at the association's office at 1028 Connecticut Avenue, Washington 6, D. C.

W. M. North, formerly assistant secretary of the National Gypsum Company, was elected recently to fill the post of the late Frank E. Davis, who had been secretary of the firm. B. L. Wootten was elected assistant secretary and Roy Lund assistant treasurer.

Mr. North became affiliated with the National Gypsum Company in 1941 and has been assistant secretary since 1942. Mr. Wootten, who came to National from the McGraw-Hill Company in 1935, has supervised the tax department since 1937. Mr. Lund has headed the firm's credit department for many years.

OBITUARIES

G. W. Jordan

Guy W. Jordan, chief chemist of the Southern States Portland Cement Company, Rockmart, Georgia, lost his life in an accident on September 5. He had been associated with the firm since 1919 after his discharge from service in the armed forces during World War I.

During college vacations Mr. Jordan was employed in the laboratories of the California Portland Cement Company and the Calaveras Cement Company. He was educated at Leland Stanford University. Mr. Jordan was a member of the American Chemical Society, the American Concrete Institute, Committee C-1 of the American Society for Testing Materials and the General Technical Committee of the Portland Cement Association.

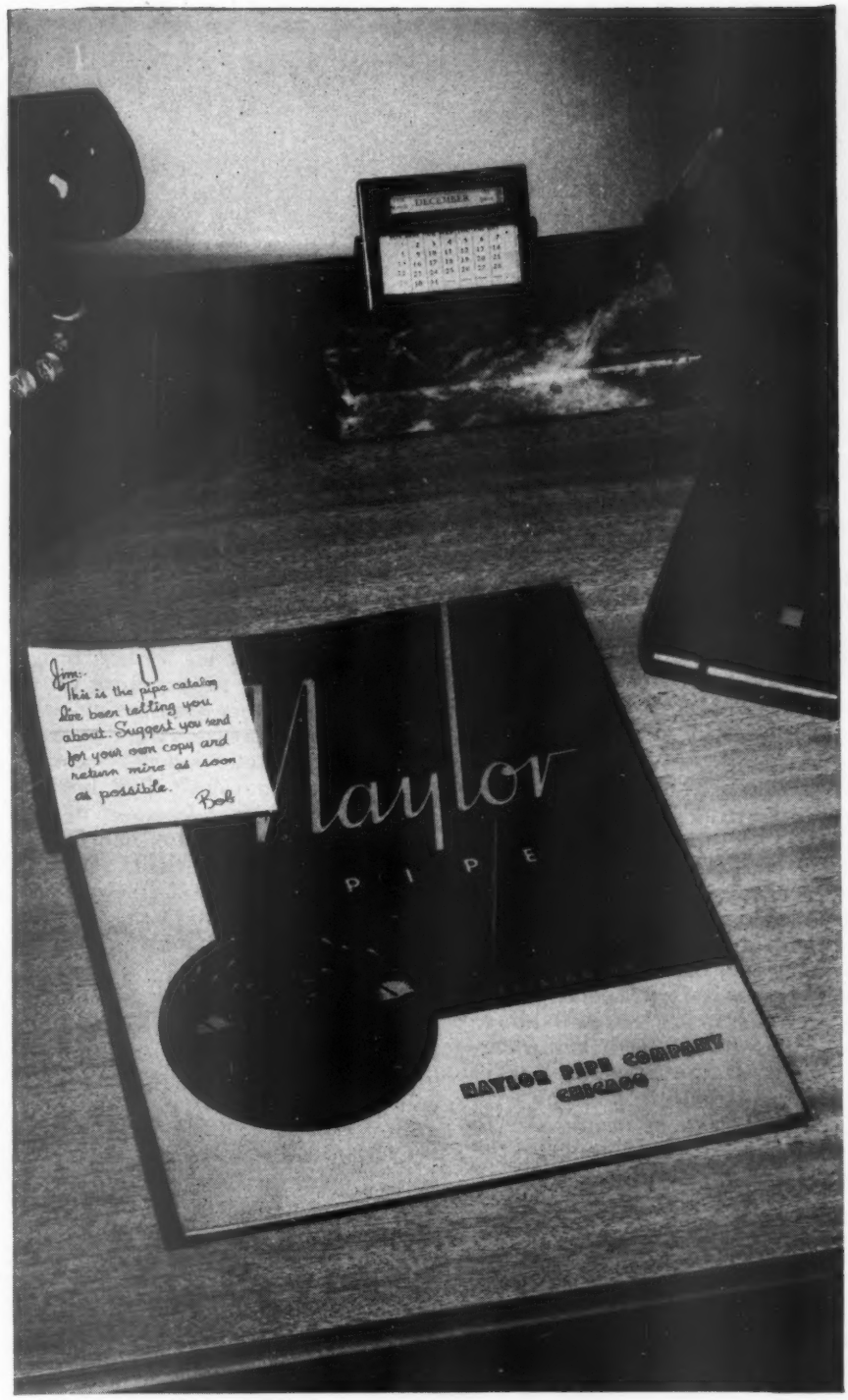
He placed in operation a successful blending plant for dry-process cement plant kiln feed and developed a quick and accurate method for determining magnesium carbonate in cement raw materials.

Albert T. Harris, an employee of the Bertrand Gravel pits at Golden, Colo., was killed recently when he was knocked down and crushed by one of the dump trucks used at the plant.

William H. Monroe, 60, owner of the Simmons Quarry at Strong City, Kan., died on September 24 at a Wichita, Kan., hospital.

Homer A. Soults, 65 years of age, died at his home in Eugene, Ore., on September 21. He was the co-founder, with Ed Smith, of the Eugene Sand and Gravel Company.

William F. Tatten Jr., 23, was the victim of a fatal accident at the Boston Sand & Gravel Company's plant at Framingham, Mass., on September 24 only a few hours after he had reported for his first day's work for the company. He was crushed to death after falling into a large cement mixing plant.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This is the pipe catalog I've been telling you about. Suggest you send for your own copy and return mine as soon as possible.
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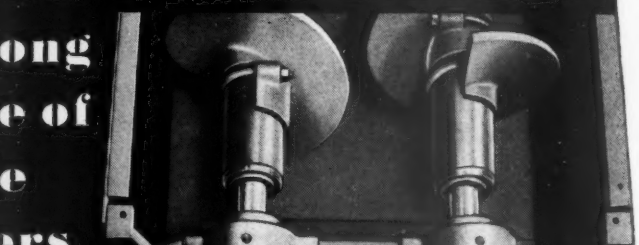

Bearings are mighty important in a washer; and of equal consequence is the protection of the bearings against the inroads of slurry and grit. Timken Roller Bearings are employed in Eagle Washers—both screw and paddle types—for smooth operation and conservation of power.

At the upper end of the tub two Timken Roller Thrust Bearings, operating in a housing, take all the end thrust of the screw shaft. Shims are provided between the cap and the housing so that any wear can easily be compensated for. Grit and water cannot wash into and abrade the bearing, as it is properly sealed as well as being located above the water line. The bearing cartridge is of the ball and socket type, and is held in position with a centering pin of ample size to transfer all thrust loads to the heavy end casting. Bearings and method of attaching the flight to the conveyor shaft is pictured above.

At the lower end of the shaft a marine type bearing made of impregnated fabric, which has proved superior to anything yet developed for this application, is used. Replaceable wearing sleeves on the shaft take up all wear. Clamped to the shaft just back of the bearing is a bearing protector which seals the bearing, holds the pressure in the bearing, and keeps particles in solution from washing into the water groove of the bearing. This arrangement is an exclusive feature of Eagle Washers.

Operating characteristics of Eagle Screw and Log Washers include: more thorough washing; controlled, concentrated water volume; high continuous capacity; longer screw life; no dead zones in tank; low power requirements; and a better product obtained at lower cost.

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EAGLE *Specialized Sand and Gravel Equipment*
"SWINTEK" DREDGE LADDERS — SCREW WASHERS
LOG WASHERS — DEHYDRATORS — SAND TANKS

EAGLE IRON WORKS
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"SERVING INDUSTRY FOR OVER SEVENTY YEARS"

CLARENCE E. WAGNER, 55, vice-president of the Wagner Quarries Company of Sandusky, O., died recently after a brief illness.

FRANK RUPRECHT, 85, president and founder of the Ruprecht Building Materials Company of St. Louis, Mo., died several weeks ago in a hospital in that city. Mr. Ruprecht had been in business for more than 50 years.

WILLIAM MOLLET, 60, employed by the Molino Lime Quarry of Molino, Mo., was crushed to death between a rock-loaded 4-ton truck and a quarry wall on October 15. Mr. Mollet was operating a grizzly when the truck rolled back upon him after jumping a log backstop.

H. LEROY GOMBAR, an auditor for the Georgia Limerock Company and the Dixie Lime Products Company of Ocala, Florida, died on July 16 at a veterans' hospital in that city.

LYLE RICHARDSON, 26, a Navy veteran, was fatally injured on August 5 at the Pontiac Stone Company's quarry near McDowell, Illinois, where he was employed. He was knocked down and pinned to the ground by the dipperstick of a crane when the chain holding it broke and allowed the stick to swing free.

A. ACTON HALL, JR., 41, who was president of the Piqua Stone Products Company of Piqua, Ohio, died on August 24 in that city.

MERLE O. WEAVER, 53, president of M. O. Weaver, Inc., of Des Moines, Ia., died recently. Mr. Weaver's firm produced sand, gravel and crushed stone in the Des Moines area.

JOHN REID, 70, caretaker at the Illinois Gravel Company's properties at Oswego, Ill., was drowned on October 9 in the Fox River a few feet from the shore. He had apparently gone to the river to inspect the company's intake valve and had fallen into the water, discharging the shotgun which he carried and shooting himself in the right arm.

MARK K. LICHTY, 59, comptroller of the Lawrence Portland Cement Company, New York, N. Y., died on September 28 at his home in Kew Garden, L. I. He became associated with the company in 1910 in Northampton, Pa., and was appointed comptroller about three years ago.

Are you contemplating the production of ready-mixed concrete — concrete blocks — concrete pipe? Separate chapters on each in the Pit and Quarry Handbook give you the latest and most complete information.

NEW MACHINERY and SUPPLIES

● Safety Guide

A body safety guide which classifies hazards by industries and recommends the proper safety clothing and equipment for maximum protection has been published by the American Optical Company, Southbridge, Mass. Free copies can be secured by writing the company.

The guide classifies 21 hazardous types of work found in the 18 industries listed and includes pictures and descriptions of different types of safety clothing which should be worn for protection against each hazard.

● New Three-Ton Trucks

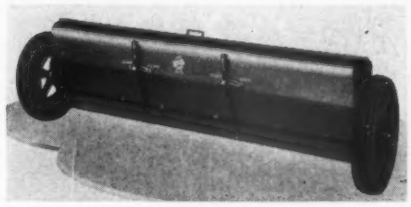
New additions have been made to the Dodge job-rated truck line, with the manufacture of two 3-ton heavy-duty trucks, in five wheelbases ranging from 136 to 196 inches. One truck has a gross vehicle weight rating of 20,000 pounds, and the other a weight rating of 23,000 pounds. As a tractor, each has a gross tractor-trailer rating of 37,000 pounds. The engine used in these vehicles develops 128 hp. at 3,200 r.p.m. Sodium-cooled valves are used in the engine, as well as a new combustion system. To reduce water and anti-freeze losses a pressure-type radiator cap which raises the boiling point has been designed.

Both models have five speed transmissions and are equipped with a power take-off opening on both sides. A new type of manifolding is employed to improve the fuel mixture distribution and effect fuel economy. Air brakes are available as extra equipment.

● Spreader-Fertilizer

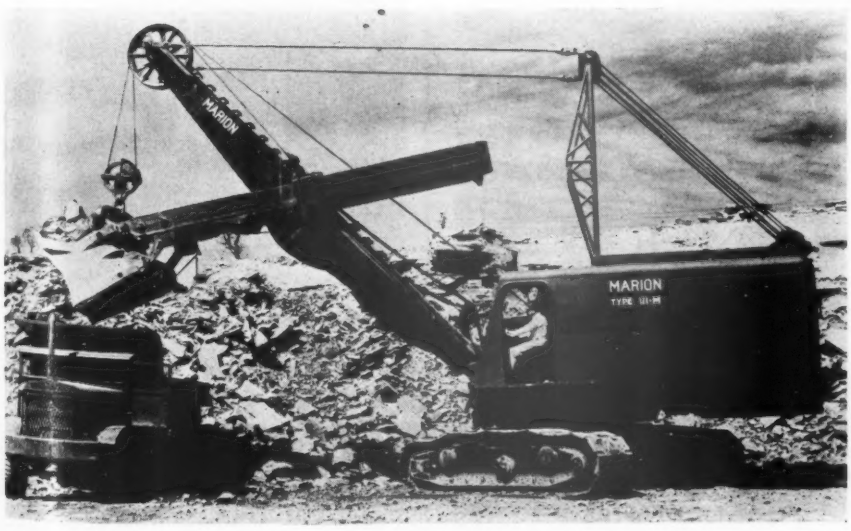
The Mount Vernon Implement Company, Inc., of Mount Vernon, New York, has placed its new fertilizer and lime spreader on the market. The machine is made of heavy gage steel, and has high-tensile machinery steel axles which are divided into two sections, permitting the operator to use one or both sides of the hopper. Each wheel drives one-half of the agitators and is clutched to allow backing without engaging them. The wheel clutch can be disengaged for traveling without driving the agitators. The hopper holds over 13 cubic feet of lime, or approximately 800 pounds. The hopper cover is made in one piece to insure a dry interior regardless of the weather, and is designed to facilitate quick loading.

The agitator bars are removable, exposing the entire interior of the hopper for cleaning. The tow bar is of the universal type, heavily anchored to the body to prevent pulling out with heavy loads. The device weighs 425 pounds, is 7 feet 3 inches long, 2 feet 8 inches high, and is 9 feet 6 inches wide. 600 x 16 rubber tires are used.



800-lb. capacity spreader.

Heavy-duty truck which is made in five wheelbases.



● Housing Seal

A newly designed housing seal for roller bearing units has been announced by the Shafer Bearing Corporation, 1412 West Washington Boulevard, Chicago 7, Illinois. The new device was developed to meet the need for a housing seal that would effectively retain lubricant and keep dirt out. The "Z" Seal element fits on an extension of the inner bearing race with minimum running clearance and is held under moderate tension yet permitted to float radially, thus correcting for possible radial displacement.

Brass construction is used in two parts to prevent corrosion and to provide natural bearing material during momentary contacts with the inner bearing race. The entire unit can be disassembled into its component parts. It is furnished as standard equipment without extra charge on all Shafer Roller Bearing Units.

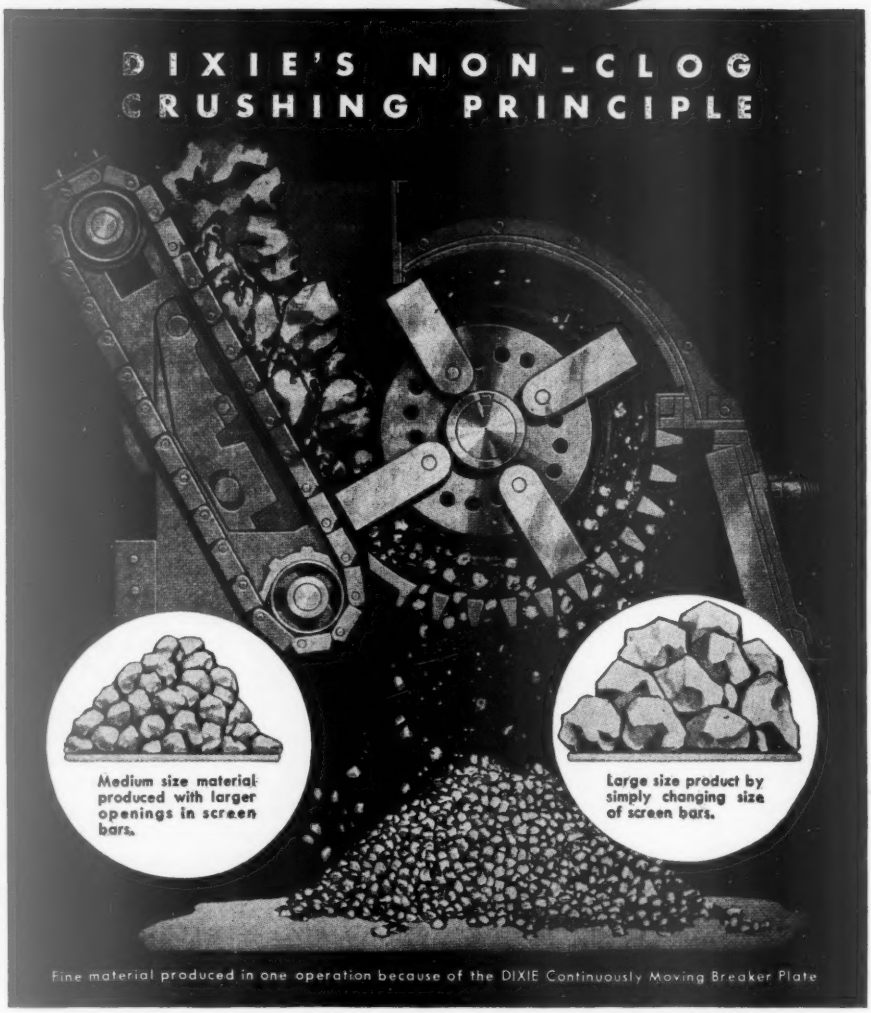
● New Quarry Shovel

A 3½- to 4-cu.-yd. diesel power shovel, which can be converted to dragline, clamshell, or crane service, has been produced by the Marion Power Shovel Company. It is to be known as the "Type 111-M," and is expected by the company to be of great service in the mining, quarrying, stripping and general construction fields.

In the Type M-111, control lever pressure is held to approximately 12 pounds maximum. Fully compensating type valves are used, enabling the operator to apply power gradually or quickly. Variable crawler widths and lengths are offered. The machine is of all-welded construction, and has a low center of gravity for stability under all digging conditions. Anti-friction bearings are furnished on all high-speed shafts. The direct line of power application furnished by the two main shafts on the upper deck is said to simplify maintenance.

Left: Convertible diesel shovel.

TAKE A LOOK AT


DIXIE'S NON-CLOG
CRUSHING PRINCIPLE
Medium size material produced with larger openings in screen bars.
Large size product by simply changing size of screen bars.
Fine material produced in one operation because of the DIXIE Continuously Moving Breaker Plate

THE DIXIE METHOD OF CRUSHING

When a DIXIE Hammermill is applied to your job by experienced DIXIE engineers, you can be sure of remarkably, increased crushing efficiency:

- No clogging, even when material has high moisture content.
- No unwarranted delays in production.
- Greater output with the same—often *less* power.
- Uniformity of product—day after day.
- Lower drying costs.

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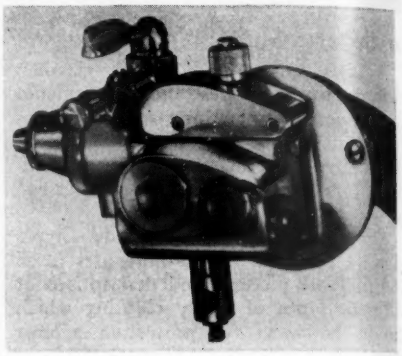
Only a DIXIE HAS THE MOVING BREAKER PLATE... Your assurance of increased production at lower cost. Get all the facts about the DIXIE. Write, wire or phone—today!

DIXIE HAMMERMILLS for

CRUSHING • GRINDING
PULVERIZING • SHREDDING

● Metallizing Gun

New economies in metal spraying can be effected by use of the "Mogul Model F Metallizing Gun", a product of the Metallizing Company of America, 1330 West Congress Street, Chicago. Important features of the new model are the small number of parts, ease of assembling or disassembling and the screened exhaust openings.

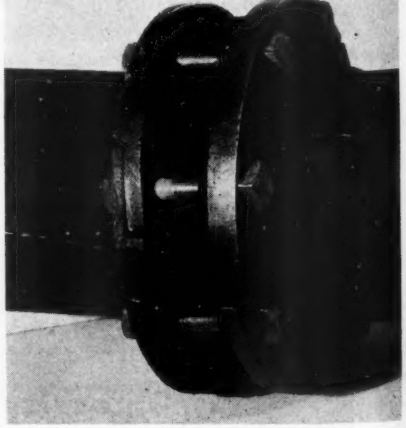


Economical to operate.

Maximum spraying speeds of 14 pounds of steel, 40 pounds of zinc or 120 pounds of lead an hour, are the announced capacities. The higher spraying speeds are said to give finer atomization of the metal and maximum deposit, both of importance for machining and long life of metallized surfaces. Any combustible gas is usable in the new device, with 50 p.s.i. air pressure. The Model F is equipped with a tool post mounting, but can be had with a pistol grip.

● Rubber Hose Joint

"Flexseal Hose Joint," a joint for rubber hose, has been developed by the B. F. Goodrich Company for application where a rubber-to-rubber contact between lengths is desired, with no metal part interposed at any point. Flexseal is recommended for the larger diameters of suction and discharge hose handling abrasive materials or corrosive liquids. The device was designed to prevent the wearing away of metal fittings in hose handling cement and to counteract the effects of acidity or corrosiveness in liquids.



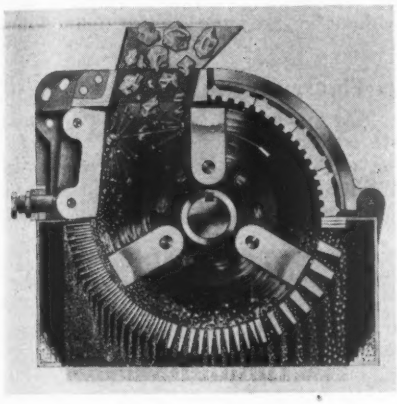
A hose joint installed.

The end of each hose section is built

up into an enlargement or head, reinforced with numerous plies of fabric and a rigid steel ring of angular cross section. To couple the lengths together, split flanges are applied over the ends of the hose and bolted together. The rubber ends of the hose are thus compressed to form a seal. The device is available in various sizes, and will handle hose with outside diameters ranging from 2¼ inches to 14¼ inches. The Flexseal flange can be bolted to the end of a standard pipe fitted with companion flanges, using one split flange to apply pressure on the flared end of the rubber hose.

● Three New Hammermills

Three new hammermills have been added to the Cedarapids line of the Iowa Manufacturing Company. They are to be known as the 2033, 3033, and 4033.



Produces finer stone.

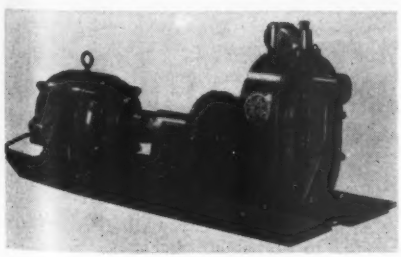
The first two digits indicate the width of the receiving opening, the second two the swing diameter of the hammers. Weights of the mills vary from 7,000 pounds to 12,000 pounds.

Among the new design features built into these machines to produce a finer and more uniform product are the non-plugging 180-degree grate and the heavy fly wheel, which tends to flatten out the power curve.

The hammers have a 33-inch swing diameter, to give usual hammer speed with lower r.p.m., an advantage said to result in a higher percentage of feed to be brought down to specified sizes per unit of power.

● Mine Gathering Pump

A modified addition to the Marlow line of self-priming centrifugal pumps has been made with the production of



For easy priming.

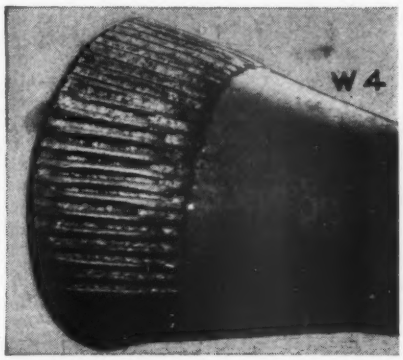
the "Type EM" mine gathering pump, which has no ports, by-passes or other auxiliary devices on suction lifts as high

Easy Build-Ups that last and last . . . . .

To replace substantial portions of iron or steel equipment parts that have worn away in hard service, excellent economy is obtained with Amsco Nickel-Manganese Steel Filler Bars and Shapes. This metal, like standard austenitic manganese steel shows high resistance to impacts and abrasion, and surface-hardens under cold working. When used to restore ordinary ferrous parts, the built-up portion has much greater wearing life than the parent metal. A better-than-new part is thus obtained at a much lower cost than an actual new part.

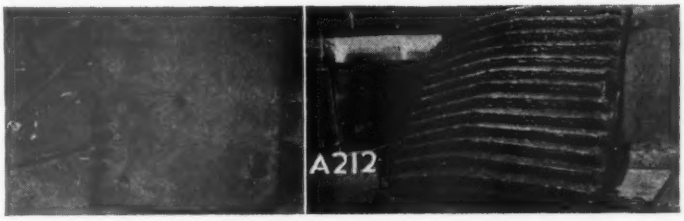
Application requires minimum time and labor. For tacking on bars and shapes, there is nothing better than Amsco Nickel-Manganese Steel Welding Rod. The nickel content of this rod or electrode prevents embrittlement of the weld under air cooling, and eliminates the need for quenching, which might change the character of the parent metal; particularly carbon steel. The weld metal deposits in a uniform flat bead without porosity, and with very little spatter or crater checks.

Typical applications are shown in the pictures.



W-4 Manganese steel crusher mantle 128" in diameter, rebuilt with Amsco Nickel-Manganese Steel Filler Bars, tacked on with Amsco Nickel-Manganese Steel Electrodes.

A variety of bars, flats and shapes are available for rebuilding worn lips and wear plates on dippers, dragline and clamshell buckets, and repairing tractor grousers, building up worn crusher jaws and parts, making and repairing bearing plates, and a multitude of other uses, all of which afford worth while savings. Worn dipper teeth can be repointed quickly and economically with Amsco Cast Repointer Bars, which are made in 31 sizes.



A-212. Rock crusher jaw before and after application of filler bars and depositing of Nickel-Manganese Steel weld-metal to restore corrugations. Cost was only a fraction of the price of a new jaw.

A-213. Three types of dipper teeth with various sizes of repointers tacked on and partially filled in to show reclamation procedure.

(Amsco Welding Products are produced and sold in Canada by Canadian Ramapo Iron Works, Inc., Niagara Falls, Ontario.)

AMSCO

Foundries at

Chicago Heights, Ill.; New Castle, Del.; Denver, Colo.; Oakland, Calif.; Los Angeles, Calif.; St. Louis, Mo.

Offices In Principal Cities

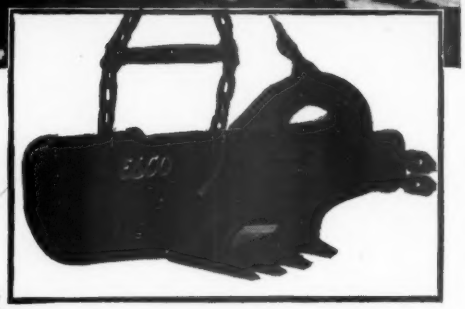
AMERICAN MANGANESE STEEL DIVISION

CHICAGO HEIGHTS • ILLINOIS

AMERICAN Brake Shoe COMPANY

deadweight or payload?

ESCO 2½-yard standard bucket on operation of Central Mining Co., Alaska.



ESCO

Dragline Buckets

eliminate excess weight, carry greater payloads

To stand the gaff on hard jobs, a dragline bucket need not be excessively heavy.

ESCO buckets, the strongest per pound ever built, enable the operator to take bigger payloads, often using buckets of greater capacity than would be possible with other makes.

There are two main reasons for the oversize loads of *ESCO* buckets, and for the long, unfailing service they give:

1. *ESCO Manganese Steel* used for all parts subject to wear and shock, including rigging. Manganese steel castings get harder and tougher the more they work, need not be cast excessively heavy in order to allow for wear. Manganese steel castings polish in use, lessen friction, resist abrasion.
2. Engineered for efficient digging. *ESCO* buckets are designed by top notch engineers who also are practical construction men. Streamlined tooth horns are cast integrally into the cutting lip — no bulky tooth holders to offer resistance.

Buckets for Special Purposes

ESCO dragline buckets are available in three types — standard, medium and heavy duty. In addition, *ESCO* designs and builds special buckets for unusual operations. Consultation is invited on special excavating problems. See your nearest *ESCO* representative or write direct. Catalogs of dragline and dipper buckets on request.

ELECTRIC STEEL FOUNDRY

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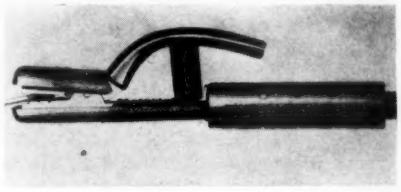
IN CANADA— ESCO LIMITED, 1084 Homer St., Vancouver, B. C. Telephone Marine 2343

as 25 feet. The pump is fitted with a four-vane open-type impeller, with relatively large clearances between the tips of the impeller vanes and the ends of the diffuser vanes, to facilitate priming even when large quantities of solids are handled. Both the impeller and diffuser are replaceable. All parts that come in contact with water are constructed of acid-resistant bronze. (Where the water to be handled is "sweet," an all-iron model can be furnished.)

The Type EM is available in two sizes, 2 or 3 inches, both with 1,800 r.p.m., 2- or 3-hp. motors. Pump and motor, on a sled-type base, measure 23⅞ inches high, 12¾ inches wide and 57 inches long. Capacity is 40 to 240 g.p.m. The discharge tee is constructed so that it can be used in any horizontal position, 90 degrees apart. This permits the pump to be placed conveniently, without regard to the direction of discharge.

• Electrode Holder

"Twecotong," a new line of manual arc welding electrode holders, is a product of the Tweco Products Company, of Wichita, Kansas. Two full insulated and two semi-insulated models are being



Tong-type holder.

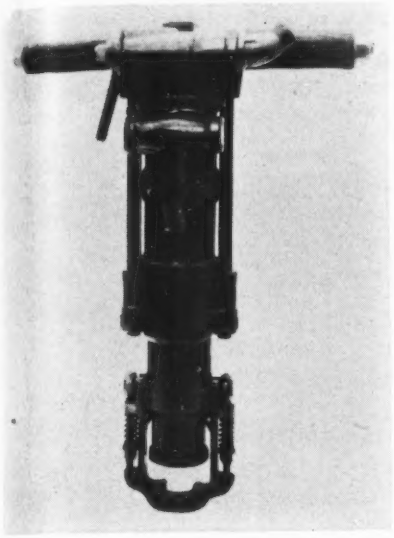
made. The 300-ampere holders have ¼-inch-electrode capacity, and the 500-ampere holders will take ⅜-inch electrodes.

The Twecotong is a conventional tong-type holder, featuring molded-laminated glass cloth bakelite insulation keyed to the holder casting. The tensioning spring is seated on fiber washers and is protected from splatter by Neoprene tubing.

• A new Hyster pneumatic-tired, 4,000-pound, fork-type lift truck has been announced as the Hyster "40." The truck is equipped with a Wisconsin air-cooled motor, a trunnion steering and 7.00 x 12 pneumatic tires; it was designed for indoor operation or outdoor road surfaces. The "40" is in production at Danville, Illinois.

• Air-Cushioned Drill

Offered by Schramm, Inc., of West Chester, Pa., the "D-45" rock drill is operated by a new type of patented valve. The machine is made of drop-forged steel throughout. It has a quick-acting,



Has new patented valve.

rugged retainer and is fully air cushioned. Exhaust ports are so arranged as to direct the exhaust away from the operator; they are of ample size to prevent freezing in the most severe weather. The drill can be furnished for either ⅞-inch or 1-inch steel.

• Wire Rope Connector

A product of the Electroline Company, 4121 S. LaSalle Street, Chicago, Ill., the Electroline-Fiege Wire rope connector is available in many different types to fit all rope sizes. The device was designed to dampen vibration stresses and prevent

Cross sections of a connection.

weak point crystallization and resultant rope failure.

To fasten a connector on a wire rope, the cable is put through the sleeve, and the protruding strands unlaid. For hemp-centered wire rope, the strands are then fanned out for insertion of the plug.

Once the socket is screwed on, the joint may be readily inspected through an inspection hole drilled into one face

FOR LONGER ROPE LIFE— WICKWIRE SPENCER WIRE ROPE —IN ALL SIZES AND CONSTRUCTIONS —FOR EVERY NEED.

Constant, careful control through every step of manufacture assures dependable performance, safety and long life in Wickwire Spencer Wire Rope.

HOW TO PROLONG ROPE LIFE AND LESSEN ROPE COSTS . . .

Thousands of wire rope users—old hands and new—have found "Know Your Ropes" of inestimable value in lengthening life of wire rope. Contains 78 "right and wrong" illustrations, 41 wire rope life savers, 20 diagrams, tables, graphs and charts.

For your FREE copy, write Wire Rope Sales Office, Palmer, Mass.

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EASTERN GENERAL SALES OFFICE 361 DELAWARE AVE., BUFFALO 2, N. Y.
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EQUIP YOUR WORKERS
WITH THIS 4-WAY PROTECTION
and you'll breathe easier, too
SIMPLIFY YOUR SAFETY PROGRAM
by giving Protection plus Comfort

No. 780 Respirator Illustrated

The low breathing resistance offered by this Willson No. 780 Respirator is matched by the low worker resistance to wearing them.

Two double filters and a mechanical seal exhalation valve, together with a molded pliant rubber face piece provide the breathing and wearing comfort that overcomes the workers' usual objections to such equipment.

The flexible face piece, conforming to all facial contours, with an adjustable nose spring and headband, assures a snug fit against dust leakage. U. S. Bureau of Mines Approval No. 2149 insures the respirator's efficiency in filtering out the four types of dusts and fumes listed here.

Protects against...

1. Pneumoconiosis-producing Dusts
2. Metal Fumes
3. Toxic Dusts
4. Nuisance Dusts

For help with your respiratory or eye protection problems, get in touch with your Willson distributor or write to Willson Products, Inc., 102 Thorn Street, Reading, Pa.

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

DOUBLE WILLSON PRODUCTS INCORPORATED

Established 1870

120 THORN STREET, READING, PA., U.S.A.

of the hexagonal tightening shoulder. (Indicated by arrow in illustration.)

No hot metal is required for installation—an advantage where explosive or inflammable materials are involved. Applications include shovels, drag lines, conveyors mining equipment and similar uses.

● Nozzle for Extinguisher

A product especially useful as emergency fire-fighting equipment is the Foamite Airfoam-generating nozzle. The

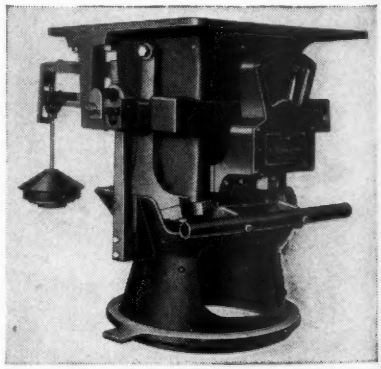
Dual-purpose nozzle.

device, made by the American LaFrance-Foamite Corporation of Elmira, N. Y., measures only 2½ inches in diameter at the widest part of the barrel.

In operation, it mixes water, air, and Foamite Airfoam liquid to make Airfoam, which is then discharges on the blaze. It extinguishes fires involving flammable oils, paints and varnishes. It is a dual-purpose nozzle, and can be operated for either a foam stream or a clear water stream.

● New Filler-Weigher

"Weighs as it fills" sums up the one, simple, semi-automatic operation of "OK Bagging Scales," manufactured by the OK Scale Company, 30 Southwood



Weighs as it fills.

Drive, Kenmore, N. Y. Burlap, cloth or paper bags up to 200-lb. capacity are easily handled without the need of skilled help. The controlled weight indicator helps to remove guesswork and speeds up weighing.

• Light Air-powered Winch

The Sullivan Division of the Joy Manufacturing Company has announced a small, lightweight, air-powered hoist, the "Air-Winch," capable of lifting 500

Versatile new hoist.

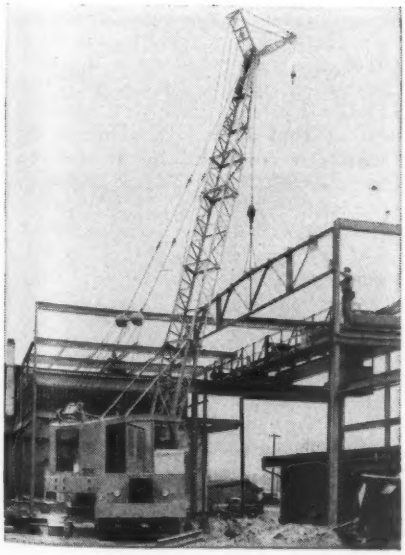
pounds, although it weighs only 85 pounds. It has a capacity of 500 feet of ¼-inch rope, and is 18 inches long, 9½ inches high and 11 inches wide. The winch is powered by a simple four-cylinder, reversible, piston-type air motor.

It can be mounted in any position on a car, timber or bar. Regular equipment includes a set of clamps for mounting, but chains or common drift bolts may be used to secure the winch if desired.

The unit can be used to hoist and lower machines and materials, to drag blocks into place or to pull large jumbos or mine cars. A conveniently operated brake lever holds the load firmly and prevents the drum from spinning.

• New Truck Crane

The Koehring 304 Truck Crane has just been announced by the Koehring Company of Milwaukee. Lifting capacity is 40,000 pounds with outriggers, 15,800 pounds without outriggers. Both are 85 percent ratings.

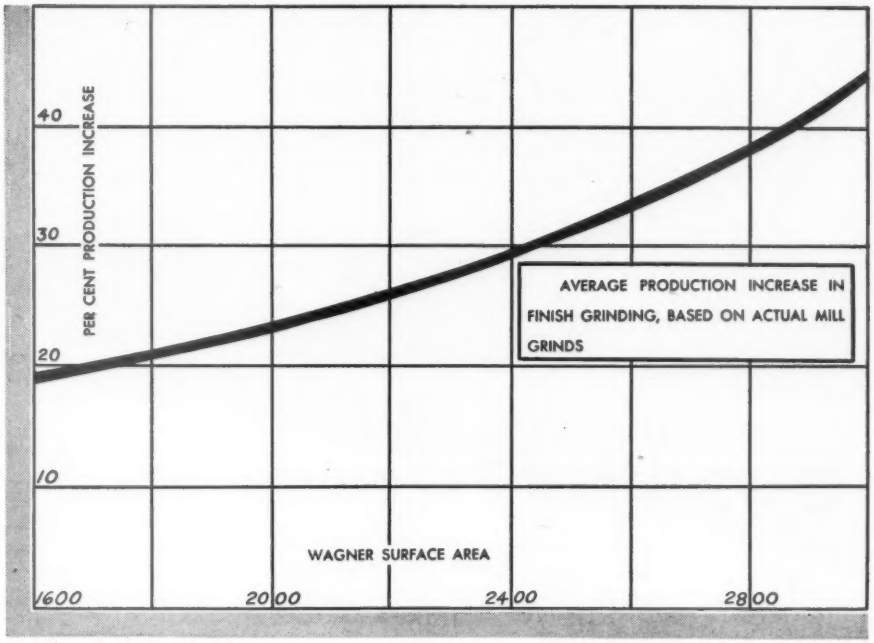


Fast-moving truck crane.

The same base machine used by Koehring on the 304 crawler model is utilized on the 304 Truck Crane.

You can keep
GRINDING COSTS DOWN *with* TDA

That's why over 50% of U. S. cement plants use TDA



TDA

WHAT IS TDA?

TDA is a catalyst-dispersing-agent used as a grinding aid. Used in amounts of 1½ to 4 oz. per barrel of cement, it not only increases production, but its presence improves many of the important properties of concrete, such as durability, strength, and impermeability.

TDA is being increasingly used to keep down grinding costs. On the chart you can find the average production increase in finish grinding which operators are obtaining in actual mill grinds. Some use TDA for special fine grinds, and others use TDA when bottlenecks occur in the finish grinding departments. TDA is widely used in making high early strength cements. And many plants use TDA in all their cement.

TDA is *not* an air-entraining agent, but gives increased durability to concrete where freezing and thawing in the presence of calcium chloride is not a factor.

You can use TDA with confidence. It is approved for use in cement and has been field-tested in over one hundred million barrels of portland cement.

Our engineers will be glad to work with you in making trial runs in your own plant. Write to the Cement Division of the Dewey and Almy Chemical Company, 65 Whittemore Avenue, Cambridge 40, Massachusetts.

★ ★ ★

DEWEY AND ALMY CHEMICAL CO.
CAMBRIDGE 40, MASSACHUSETTS

Ready to serve!

You can't pass road mixes across the counter like sugar or salt, but certain unique features of KOTAL MASTER MIXES make it possible to handle them almost as easily as that.

KOTAL MASTER MIXES can be stockpiled ready for delivery in any quantity at any time, regardless of season or weather. That's a great convenience and a saving for plant, contractor and customer. Only the KOTAL Process makes this possible.

Let us tell you more about this important scientific development in the art of road building and maintenance. We'll gladly send free booklet to you—also the name of your nearest supplier.

KOTAL COMPANY
360 Springfield Ave. ★ Summit, N. J.

KOTAL Master Mixes
The Advanced All-Weather Aid in Building Better Roads

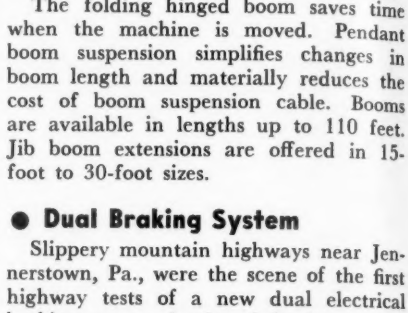
Removable outriggers are optional, and permit efficient operation as a shovel, pull shovel or dragline.

Designed for easy handling on street or highway, the Koehring 304 Truck Crane can go anywhere that a truck can go. Because of its high travel speed job-to-job moving time is reduced materially.

The folding hinged boom saves time when the machine is moved. Pendant boom suspension simplifies changes in boom length and materially reduces the cost of boom suspension cable. Booms are available in lengths up to 110 feet. Jib boom extensions are offered in 15-foot to 30-foot sizes.

● Dual Braking System

Slippery mountain highways near Jennerstown, Pa., were the scene of the first highway tests of a new dual electrical braking system developed for heavy-duty vehicles. The test was conducted by the Warner Electric Brake Company of Beloit, Wis., and observed by engineers of



J. G. Oetzel (right), executive engineer, Warner Electric Brake Co., and H. W. Overman, manager of industrial friction materials for Thermoid, examine the new retarder.

the Thermoid Company of Trenton, N. J., whose friction materials are used in the system.

Two independent braking systems are used in this new application. One is an electric "retarder" mounted on the drive shaft of the tractor and on a live axle of the trailer, employing the principle of the Eddy Current Brake. A separate system of conventional shoe brakes on all wheels is controlled by an electro-magnetic circuit operated by an ordinary brake pedal.

The Warner retarder is a simplified form of electric generator. When excited, it produces a braking effect by generating electric current which is converted into heat and dissipated by the cooling fins of the retarder rotor. For emergency stops, a micro switch on the brake pedal activates the retarder to full capacity at the instant the pedal is touched, regardless of the speed rheostat setting.

The separate system of conventional shoe-type wheel brakes is operated by a rheostat balanced electro-magnet device incorporating specially compounded Thermoid friction materials which activate conventionally-lined brake shoes on the wheels.

The magnetic wheel brakes are now in actual production.

TRADE NOTES

Clarence H. Collier, Jr., has been named manager of the Industrial Lift Truck Eastern Division of the Hyster Company, Portland, Oregon, and Peoria and Danville, Illinois. Mr. Collier's headquarters will be in Peoria.

Wickwire Spencer Steel, Division of the Colorado Fuel & Iron Corporation, has moved its general sales manager's office from 500 Fifth Avenue, New York, to 361 Delaware Avenue, Buffalo. The Wire Department's general office, the Market Research Department and the Advertising Department will also be located at Buffalo. The Wire Rope Department was moved to the plant at Palmer, Massachusetts, last summer. The New York City sales office will hereafter be known as the Eastern District sales office.

Percy Jenkins, sales manager of hardware products for Wickwire Spencer Steel, Division of the Colorado Fuel & Iron Corporation, has been named Eastern district sales manager, with offices at 500 Fifth Avenue, New York.

Albert M. Kahn, president of the Acme Rubber Manufacturing Company and of the Hamilton Rubber Manufacturing Corporation, announced today the merger of these two companies to form the new Acme-Hamilton Manufacturing Corporation, a Delaware corporation, with main offices at Trenton, New Jersey. Acme and Hamilton will function as departments of the newly formed corporation, with no change in personnel and policies.

On September 24, 1946, the Kennedy-Van Saun Manufacturing and Engineering Corporation of New York City honored a group of employees who have been working at the Danville, Pennsylvania, factory for 25 years or more. The veterans were awarded gold service pins by Fred O. Reedy, vice-president and general manager of the firm. The picture on this page shows the group photographed at the factory with President J. E. Kennedy, also a 25-year man, at the center front.

• Among those present for the Raybestos District Managers' Annual Summer Sales Conference held recently at the plant in Bridgeport, Conn., are (left to right), A. S. Butterworth, southwestern manager; James L. McGovern, Jr., replacement sales manager; Robert B. Davis, vice-president and general manager; John F. D. Rohrbach, executive vice-president; Norman Leeds, Jr., general sales manager, and Jerome W. Brush, Jr., merchandising manager. (Standing, left to right), F. H. Lugar, Chicago district manager; J. P. Sink, Pacific Coast district manager; M. J. Callahan, northeastern district manager; H. B. Kalagher, New England district manager; C. H. Robinson, southeastern district manager, and E. S. Allen, central district manager.

The Brill Equipment Company of New York announces the appointment of Stephen M. Schuster as advertising manager. He will coordinate all advertising, direct mail and magazine, for the company's expanding sales program.

The Heil Company of Milwaukee, manufacturers of equipment for the nonmetallic mining industries, have started construction on another unit in their current plant expansion program at Plant 3 in Milwaukee. The new unit will add more than 110,000 square feet of floor space to the facilities, which now cover 52 acres. A three-story sales office building has been completed recently at Plant 1 in Milwaukee.

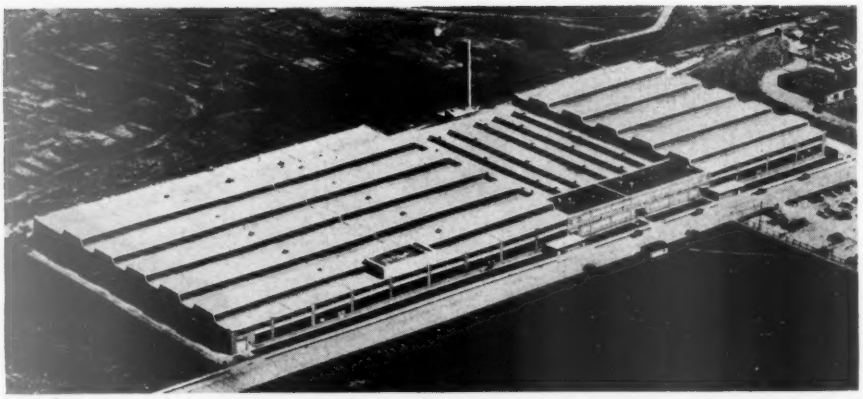
At Hillside, New Jersey, a building 30,000 square feet in area is under construction at Heil's Plant 2.

William E. Philips, engineer in charge of belt conveyor applications for the Link-Belt Company of Chicago, died suddenly of a heart attack on July 3. Mr. Philips had been associated with Link-Belt since 1923. He had been active in the development of the early anti-friction belt conveyor idler and had also been in charge of Link-Belt rotary railroad car dumpers and grain car unloaders.

Robert L. Loofbourow has been named acting sales manager by the E. J. Longyear Company of Minneapolis, whose staff he joined last year.

Walter W. Walb has been elected to succeed his father, the late Clyde A. Walb, as president of the American Steel Dredge Company, Fort Wayne, Indiana.

• Kennedy-Van Saun employees with 25-year service records honored by their firm.



The West Milwaukee ordnance plant acquired by Chain Belt.

Chain Belt Company's purchase of the West Milwaukee heavy ordnance plant will materially increase the firm's production capacity. The plant, constructed for the Defense Plant Corporation in 1943, has total area of about 317,500 square feet.

The acquisition of the new facilities increases the total area of Chain Belt plants to over 20 acres. Present plans call for the new plant to produce chain belts and construction machinery.

Ben C. Essig, vice-president of the Gardner-Denver Company, is acting president of the Manufacturers Association of Colorado. He was named to the Export Advisory Committee for the Department of Commerce.

Frank E. Briber, one of the founders of the Denver Equipment Company, has resigned from his duties as secretary and director of the company and its affiliated firms.

Harold Von Thaden, first vice-president of Robins Conveyors, Inc., Passaic, New Jersey, is in South Africa to inspect the firm's wholly-owned subsidiary, Robins Conveyors of South Africa, Ltd., located at Johannesburg.

Walter B. Hester, who has been general superintendent of mines and mills of the Baroid Division, National Lead Company, has been made production manager of the division. He is in charge of 8 mills and 11 mines in the West and Southwest.

Donald Dyrenforth has been made manager of the Western Division of the Dorr Company, with headquarters at Denver. Mr. Dyrenforth, who has been with the firm since 1920, has represented Dorr products in various states and in South Africa.

Hewitt Rubber of Buffalo, division of Hewitt-Robins, Inc., has announced the moving of its Philadelphia district office and warehouse from 20 South 15th Street to 401 North Broad Street.

Lieut. Commander Robert S. Green has succeeded his father, Allen P. Green, as president of the A. P. Green Fire Brick Company of Mexico, Missouri.

Heat & Power Company, Inc., announce the removal of their offices to a new location at 70 Pine Street, New York 5.

L. C. Gerow, recently released from the United States Army, has been appointed manager of the parts and field service department of the Insley Manufacturing Corporation, Indianapolis. He succeeds the late Charles A. Menefee. Before his entry into the armed forces Mr. Gerow had been with Insley since 1925.

Under the new name of the Superior-Lidgerwood-Mundy Corporation, the firm formerly known as the Lidgerwood Manufacturing Company of Elizabeth,

Class "XF-10" Ruggles-Coles Dryer in lime plant.

One type of Dryer can't do every job!

THAT'S WHY RUGGLES - COLES DRYERS ARE BUILT IN NINE COMPLETE, DISTINCT LINES

The science of Drying is a highly specialized branch of engineering . . . its principles based on well-known physical laws, but the application of these laws is complicated. Without practical experience in application of theoretical calculations, it is impossible to produce commercially successful results.

Ruggles-Coles Dryers (manufactured and sold exclusively by the Hardinge Company) have led the field for almost half a century. They are built in *nine* complete lines for *direct, indirect, and indirect-direct heat drying* of every known material . . . with special units for highly specialized jobs of an unusual nature. *Write for Bulletin 16-C.*

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New Jersey, has reorganized its manufacturing facilities. Plants located at Superior, Wisconsin, and Beacon, New York, will be enlarged to accommodate operations formerly carried on at Elizabeth.

C. E. Frudden

C. E. Frudden, consulting engineer of the Allis-Chalmers Manufacturing Company Tractor Division, became the sole nominee for the 1947 national presidency of the Society of Automotive Engineers, according to G. W. Curtis, general chairman of the society's eleventh annual tractor meeting recently concluded in Milwaukee, Wisconsin. The nomination is tantamount to election.

Mr. Frudden will be the first Wisconsin man and the first tractor man elected to the presidency of the 40-year-old society. He will take office at the end of January and will begin administering the affairs of the S.A.E., which is spread out over the United States, Canada and Hawaii.

R. E. Jeffries

R. E. Jeffries, a member of the Caterpillar Tractor Company organization for 12 years, has been appointed district representative for the eastern sales division.

Mr. Jeffries will contact three "Caterpillar" distributors, Michigan Tractor & Machinery Company of Detroit, Ohio Machinery Company of Cleveland and West Virginia Tractor & Equipment Company of Charleston. For the last three years he has been a member of the war contract division.

Foundation work is under way for the new plant which The Foxboro Company, Limited, is erecting on a three and one-half-acre site in the Ville LaSalle section of Montreal. The completed building will be turned over to the owners in the Spring of 1947, ready for immediate occupancy.

The Foxboro Company, Limited, is affiliated with The Foxboro Company of Foxboro, Massachusetts, one of the principal manufacturers of industrial instruments and a leader in developing the science of automatic control.

Arthur W. Herrington, chairman of the Board of Directors of the Marmon-Herrington Company, Indianapolis, Indiana, has announced that David M. Klausmeyer, C. Alfred Campbell, Guy C. Dixon and Earl J. Breech were elected to the board of directors at a recent meeting of the stockholders of that company.

Warren J. Holmes has been named export representative in the Philippine Islands for the Allis-Chalmers Manufacturing Company of Milwaukee. He will work with the Earnshaw Docks & Honolulu Iron Works, distributors of heavy industrial equipment for the firm's general machinery division.

The following appointments of new distributors have been announced by three equipment manufacturers:

Hewitt Rubber: Monarch Rubber & Supply, Inc., 546 Howard Street, San Francisco; L. J. Burmester and J. H. Foutz in charge; job-engineered industrial rubber products.

Davey Compressor Company: Brown & Hubert, Inc., 216 S. E. 8th Street, Evansville, Indiana, the Florida-Georgia Tractor Company of Savannah and Waycross, Georgia, and the Wabash Equipment & Supply Company, 310 Test Building, Indianapolis.

Barber-Greene Company, Aurora, Illinois: Overton & Ross, 2701 Main Street, Dallas, Texas; Cochran Equipment Company, 200 Portwood Street, Houston, Texas; Engineered Sales, 222 North Drive, San Antonio, Texas; Fred Berryhill Equipment Company, 210 Q Avenue, Lubbock, Texas; Contractors Equipment & Supply Company, 1420 Myrtle Street, El Paso, Texas; Contractors

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Call on the nearest HAISS Distributor —or write
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HAISS
PORTABLE CONVEYORS • SNOW LOADERS • CLAMSHELL BUCKETS

Equipment & Supply Company, Springer Building, Albuquerque, New Mexico; Ray Corson Machinery Company, 1600 15th Street, Denver; Southern Equipment & Tractor Company, Monroe and Baton Rouge, Louisiana; Paul L. Matchette Company, Kansas City, Mo.

D. E. Fricker, who recently returned to civilian life from service in the United States Army, has rejoined the Le Roi Company of Milwaukee as assistant to the advertising manager.

Luis Perez Arteta, a representative of the Toledo Scale Company in Quito, Ecuador, has recently completed special training at the firm's factory at Toledo.

Legal Decisions

By LEO T. PARKER

A review of new law suits affecting nonmetallic products producers, sellers, purchasers, and users.

Recently a reader wrote in part, as follows: "For many years our customers have used the street in front of our yards to park their cars while doing business with us. Last month the city placed 'No Parking' signs there. Can these officials do this to us? We are losing customers."

The answer is no, unless such signs are reasonably necessary and likely to reduce traffic congestion in an area where safety of pedestrians and other drivers is an important consideration.

According to a recent higher court, municipalities may act under specific constitutional and statutory authority and enact *reasonable* regulations affecting the use of the streets, which includes the control of traffic. In other words, property owners own streets to their center; they have rights in ownership of the streets as against a city enacting unreasonable traffic regulations, including a ban on parking. Otherwise, owners of abutting property cannot object to parking restrictions.

For illustration, in *Hoyne* v. *Wurstner*, 63 N. E. (2d) 229, it was shown that for approximately 30 years a man named Hoyne has owned and operated a necessary business. Recently the officers of the police department placed a "No Parking" sign on the curbing, leaving only a 40-foot space in front of his business for parking.

Hoyne appealed to the higher court on the grounds that the city ordinance is void because he owns the street to its center.

The higher court refused to order the city to change the limitation on parking enforced by the police officers.

Therefore, parking restrictions are valid which are reasonably necessary for the public's welfare.

Must Collect Demurrage

The law imposes upon a common carrier the absolute duty to collect freight charges, including demurrage charges.

For example, in *Chicago & N. W. Ry. Company* v. *Mallory*, 23 N. W. (2d) 735, it was shown that a contractor found it impossible to unload 10 carloads of gravel because the gravel content of the cars had frozen during transit, and was a solid mass of ice and gravel. The carrier sued the contractor who attempted to avoid liability on the grounds that the delay in unloading the cars was brought about by the carrier's refusal to furnish steam and water so that the lading could be thawed out sufficiently to make unloading possible.

Notwithstanding this argument, the higher court held the contractor fully liable for the demurrage charges amounting to $902. This court said:

"It is not only the right, but the duty of a carrier to collect the charges."

On the other hand, in *Chesapeake & Ohio* v. *Board*, 100 W. Va. 222, the higher court held that if an act of God prevents unloading of cars, the consignee is *not* liable for payment of demurrage charges.

Contractor Encounters Unforseen Obstacles

It is well established law that where the owner of a project does not *misrepresent* prospective work, or existing conditions, a contractor must fulfill the terms of this contract, irrespective of extra or unexpected expense in completing the contract.

For example, in *Jackson Materials Company* v. *Grand River Dam Authority*, 170 Pac. (2d) 552, reported Sep-

PAGE *AUTOMATICS* ARE STANDARD EQUIPMENT ON ★ MOST DRAGLINES ★

THE Page *AUTOMATIC* is the only dragline bucket that will automatically land in a ready-to-dig position and hold this position with all lines slack. The instant the load line is pulled the *AUTOMATIC* will dig right in and come up with a full load within *one* or *two* bucket lengths. Therefore time is saved and yardage is increased.

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tember, 1946, it was shown that a contract provided that the general contractor would perform all work and furnish all supplies to construct a dam in accordance with the plans and specifications and under the direction of the engineers employed by the owners of the project.

The specifications estimated that approximately 500,000 tons of crushed rock and approximately 350,000 tons of sand would be required.

A sub-contractor took a contract from the general contractor and agreed to build at the quarry site a suitable quarry and rock-crushing plant capable of producing and supplying 1,500 tons of crushed rock per day. The subcontract also provided that the sub-contractor would remove all overburden at the rock quarry. The price to be paid the sub-contractor was 70 cents per ton for crushed rock, and 25 cents per cubic yard for *removing overburden* at the rock quarry. The contract price for sand was 30 cents per ton f. o. b. cars at the sand plant.

After completing its contract the subcontractor filed suit to collect from the owners of the project extra payment of $12,085 for "super-stripping," that is, removal of sandstone as a part of the overburden at the rock quarry. The higher court refused to allow the subcontractor to collect this extra sum, and would not permit the sub-contractor to prove that the commonly accepted meaning of term "overburden" did not include "watered stone" or unsuitable stone for aggregate or hard stone that was not suitable limestone to be used in aggregate to make concrete.

The sub-contractor also asked the court to allow it extra payment of $84,000 because in the operation of the quarry mud seams were encountered so that it became necessary for the sub-contractor to remove 16,849.8 tons of mud from the seams in the quarry. The higher court refused to allow the sub-contractor extra payment for this work, and said:

"So far as the record shows, neither party knew of the existence of the mud seams at the time the contracts were executed or at the time the site for a quarry was selected. The evidence shows no more than that the mud seams encountered and the necessary removal of the mud therefrom were an unforeseen obstruction or difficulty encountered in the prosecution of the work."

City Abandons Contract

The question has arisen from time to time: Can a contractor or engineer recover payment from a city for services rendered a municipality on an abandoned project? The answer is yes, if the city stood a chance to be benefitted by services rendered by the contractor.

For illustration, in De Leuw, *Cather & Company* v. *City of Joliet,* 64 N. E. (2d) 779, reported June, 1946, it was shown that an engineer sued a city to recover $46,350 for engineering services rendered in connection with a proposed new municipal water works system, although the city did not proceed with the work.

Notwithstanding the fact that the city failed to complete the project, the higher court held the city liable for full value of the services rendered by the engineer. This court said that the services rendered by the engineer were worth even more than $46,350, although the city was not benefitted in the least.

Fact Finding Board

According to a recent higher court the Silicosis Medical Board, though composed of experts, is a fact-finding board, and its findings are subject to review by the Industrial Commissioner, Appeal Board, and the higher court.

For example, in *Henley* v. *State Compensation Com'r,* 38 S. E. (2d) 380, reported August, 1946, an employee sued his employer to recover benefits for silicosis, under the State Workmen's Compensation Act, alleged to have been contracted while he was in the employ of his employer. Both the State Compensation Commissioner and the Workmen's Compensation Appeal Board refused compensation on the ground that the employee's *exposure* within one year prior to the filing of his application was *insufficient* to have produced silicosis or to have injuriously aggravated a pre-existing silicosis. These decisions were based on the reports made by the Silicosis Medical Board.

The employee appealed to the higher court and introduced testimony which disclosed that rock dust in considerable quantities was present in the mine in

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which he worked.

It is interesting to observe that the higher court reversed the previous decisions holding that the Silicosis Medical Board is merely a "fact finding" board.

Also, see *Jones, 38 S. E.* (2d) 379, where the higher court held: "An allowance of compensation under the general law does not have the effect of barring future claims, provided there is progression or aggravation of the injury, and, provided further, that application for additional compensation is made within the period prescribed by the statute."

Driver Backs Truck

Failure of a driver when he backs his truck to warn drivers of other automobiles of the "apparent" danger places liability on the truck owner.

For example, in *Herring* v. *Holicer Company, Inc.,* 22 So. (2d) 868, reported August, 1946, it was shown that the driver of a passenger car sued for physical injuries sustained by him when the driver of a motor truck decided to turn it around on a country road. He backed the trailer into the intersecting road, where the passenger car collided with it.

The higher court held the injured driver entitled to recover full damages from the truck owner because the truck driver was negligent in attempting to make a turn without first placing flares on the highway or using other means to warn drivers of other automobiles of the danger.

Fair Labor Standards Act

An employee who sues his employer under the Fair Labor Standards Act has the burden of proving that he performed work for which he was not properly and legally compensated.

This court also held that in suits of this nature the employer proves his case by producing as evidence full and complete wage records. Failure to do so will entitle the employee to a favorable verdict. See *Anderson* v. *Mt. Clemens Pottery Company,* 66 S.Ct. 1187.

Double Compensation

Contrary to the opinion of a majority of readers, an injured employee, in addition to receiving compensation from his employer, may sue and recover damages from a third person whose negligence caused the injury.

For illustration, in *Cleason* v. *Geary,* 8 N. W. (2d) 808, it was shown that a concrete contractor was installing a new floor for a hatchery company when one of the latter's employees fell in the concrete forms and was seriously injured.

The higher court held that the employee could recover compensation from the hatchery company, his employer, and also could recover heavy damages from the concrete contractor whose negligent construction of the forms resulted in the injury.

Beneficial Law

Considerable discussion has arisen from time to time over the legal question: If an employee contracts silicosis before a state law is passed or amended authorizing benefits, is the employee benefitted? The answer is yes.

For illustration, in *Peterson* v. *Federal Company,* 170 Pac. (2d) 611, reported September, 1946, it was shown that in 1945 an amendment to a State's Occupational Disease Compensation Law increased the maximum compensation. An employee who started to work in 1935 contracted silicosis and died. The state authorities contended that his dependents were not entitled to increased compensation specified by the 1945 state law, but the higher court held otherwise. The court said: "The provisions of the Workmen's Compensation Law do not become fixed as to interested parties at the time the employment begins, but at the date of a compensable accident."

This court also held that when an employee dies, his dependents' compensation become fixed at the time of the death.

Truck Driver Violated Ordinance

Many persons believe that when a truck driver effects an injury when violating a city ordinance, the owner of the truck, always is liable for resultant damages. However, this is not so, according to a late higher court decision.

For example, in *Brey* v. *Rosenfeld Sand and Stone Company,* 48 Atl. (2d) 177, reported September, 1946, it was shown that a motor truck owned by the Rosenfeld Sand and Stone Company was parked almost at right angles to the curb, with its rear wheels on the side-

In phosphate washing and in cement manufacture froth flotation is accepted as a practicable and profitable part of the flowsheet.

The Massco-Fahrenwald Flotation Machine, the most recent creation of Dr. A. W. Fahrenwald, embodies important basic improvements in the art. In this machine pulp and air are introduced separately to the impeller, instead of together.

ADVANTAGES: (1) Greatly increased aeration; (2) More air per unit of power input; (3) Better diffusion and more uniform distribution of air; (4) Remarkable ability to increase aeration with feed overloads.

State your problem and permit us to present more complete details and data.

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walk. A chute extending from the rear of the truck to a form was delivering ready-mixed cement to the form. The sidewalk at that point was thus blocked, making it necessary for pedestrians using the sidewalk to go into the street and pass around the front of the truck. This truck was parked in violation to a city ordinance.

A boy had been standing on sidewalk near the truck watching the cement being delivered through the chute. The boy decided to go down the sidewalk and was compelled to walk around the truck into the street. He was killed by a passing automobile. His parents sued the Rosenfeld Sand and Stone Company for damages, alleging that the latter was liable because its driver had parked the truck in violation to the city ordinance, thus compelling the boy to leave the sidewalk and walk into the street.

In holding the Rosenfeld Sand and Stone Company not liable, the higher court said that violation of the ordinance was not of itself proof of negligence on the part of the truck driver.

Eminent Domain

Of course, it is well known that when the government, state, county or municipality "takes" private property for public purposes, it must pay the owner the reasonable value of the property. On the other hand, mere taking "possession" of land without assuming title thereto is not a "taking" which entitles the owner to receive a sum equal to the value to the land.

For example, in *O'Connor Gravel Company* v. *United States,* 155 Fed. (2d) 425, reported August, 1946, it was shown that the United States took possession of land and made installations for removal of gravel, but abandoned the project before removing any gravel. In subsequent litigation the higher court held that the owner of the land was entitled *only* to an award of damages for loss of use and occupancy of the land, and *not* to an award for "taking" of title to the land.

Questions and Answers

[Mr. Parker will be glad to answer questions regarding legal problems of PIT AND QUARRY readers. Questions should be addressed to Leo T. Parker, Legal Editor, PIT AND QUARRY.—Ed.]

Legal Editor: Will you kindly advise whether or not a quarry—whose product consists of approximately 95 to 98 percent agricultural limestone which is sold directly to farmers and to truckers who, in turn, sell it to farmers, all in Illinois, and whose other business—the remaining 5 percent—consists of chips which are sold to individuals for driveways, and to farmers for cow yards and farmyards, all in Illinois—is engaged in interstate commerce, so that it must comply with the Fair Labor Standard Act and pay its employees for time and a half for over 40 hours a week. We do occasionally sell a little flagstone, all of which to our knowledge has been sold to people residing in Illinois.—G. P. S. C.

Answer: It is true that the present-day courts very broadly construe the Fair Labor Standards Act. However, a company that does strictly intrastate business is not within this law. But, if a company sells or manufactures any product which is used to further interstate commerce, it is within the law. Thus, if a firm sells products to a railway company, it must pay the wages specified by this law, because the railway company would further its interstate business by use of the products. However, since all your merchandise is sold and also used within the state, I do not think you are within the terms of this law. Recently, however, a company drilled for oil, and was paid by another company which shipped the oil into other states. The company which did the drilling on a purely cash basis of payment was held within the terms of the law.

Legal Editor: What is meaning of "caveat emptor" and when is it used? —W. C.

Answer: Considerable discussion has arisen from time to time over the legal meaning of the term "caveat emptor". Broadly, it means "let the buyer beware". In other words, under ordinary circumstances the buyer of an automobile takes the risk of quality and condition, (1) unless the seller gives a warranty; (2) or there has been a false representation fraudulently made by the seller.

Ahead are months of rain, snow, ice and frigid temperature . . . months when you need a conveyor belt that can meet the weather on its own terms and win.

When the elements are giving equipment a beating and the demand for materials is on the increase . . . be prepared with Cincinnati Conveyor Belts on the job . . . know that you have the toughest, hardest working belts, regardless of weather, that money can buy.

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Hundreds of Installations . . Use Bradley Pulverizers

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CAPACITIES: 1 TO 50 TONS PER HOUR
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Feedoweight combines in a single unit a conveyor type feeder and scale.

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You need only the labor of one man and the SAUERMAN machine to do a long haul job of material moving . . . and do it easily, rapidly and economically. All over the world SAUERMAN Long Range machines are solving difficult dig-and-haul problems and making savings over estimated costs. Installation is simple. Power and maintenance items are small.

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There is a type of SAUERMAN Machine to meet your specific problem — whether for pit or bank excavation, stripping, conveying stone from quarry, stockpiling or other material handling. Operation by either electric, gasoline or Diesel power. From long experience we will be glad to recommend the most suitable equipment for your job. Complete illustrated catalog showing many typical installations will be sent on request.

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TRAFFIC News Digest

CENTRAL FREIGHT ASSOCIATION DOCKET

Docket 81246 (2)—Industrial sand, carload, subject to Columns 1 and 2 ratings and minimum weights, as described in P. M. Railroad tariff 5694-K. Establish rates on, from so-called Juniata Group, viz.: Juniata, McHale, Banksand, Millington and Watrousville, Mich.

Proposed rates in cents per net ton

To	Open Cars	Closed Cars
Mackinaw City, Mich.....	187	209
Manistique, Mich.	237	242
Menominee, Mich.	220	231

Subject to Ex Parte 148 increase.

Docket 81268 (2)—Slag, crude, crushed or granulated (the products of iron and steel furnaces) in bulk, in open-top equipment, carload minimum weight 90 percent of the marked capacity of the car, except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Youngstown, O., to Ben Avon, Pa., 88 cents; Bessemer, Pa., 99 cents and Irwin, Pa., 110 cents per net ton, subject to Ex Parte 148-162.

Docket 881276 (1)—Crushed stone, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Thrifton, O., to Trimble, Glouster and Nelsonville, O., 116 cents per net ton, subject to Ex Parte 148-162.

Docket 81291 (2) — Crushed stone: crushed stone screenings, crushed stone tailings, loaded in open-top cars only, carload minimum weight per car 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Carey, O., to Montpelier, O., 127 cents per net ton.

CENTRAL FREIGHT ASSOCIATION DOCKET

Docket 81477 (1)—Crushed stone, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Speed, Ind., to Vincennes, Ind., 132 cents per net ton, subject to Ex Parte 148-162.

Docket 81480 (1)—Stone, crushed, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply. Establish on, from Speed, Ind., to Purcell, Decker, Hazelton, Ind., 132 cents; Miller, Patoka, Princeton King and Ft. Branch, Ind., 127 cents per net ton, subject to Ex Parte 148-162.

Docket 81481 (1)—Crushed stone, in bulk, in open-top cars, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight

will apply. Establish on, from Speed, Ind., to Elberfield, Ind., 127 cents per net ton, subject to Ex Parte 148-162.

ILLINOIS FREIGHT ASSOCIATION DOCKET

Docket ORMV 511-49—Silica sand, carload from Ottawa, Ill., to New Orleans, La.
Present: $4.18 net ton
Proposed: $3.70 net ton
Rates subject to Ex Parte 148.

Docket IRC 511-497—Agricultural limestone, carload, minimum weight 90 percent of marked capacity of car, except that when cars are loaded to full cubical or visible capacity, actual weight will apply, but not less than 60,000 pounds, from Prairie du Rocher, Ill., to stations on Southern Railroad in Illinois:

To (representative)	Present	Proposed
New Baden, Ill.	Combination	116
Hoffman, Ill.		105
Centralia, Ill.		94
Browns, Ill.		116
Mt. Carmel, Ill.		127

Docket IRC 511-498—Agricultural limestone, carload from Cordova, Ill., to stations on C.B.&Q., C.R.I.&P. and R.I.S. Railroad in Illinois:

To representative	Present	Proposed
C.B.&Q. Railroad		
Abingdon, Ill.	1.05	.94
Biggsville, Ill.	1.20	1.07
Castleton, Ill.	1.33	1.07
Galesburg, Ill.	1.05	.79
Macomb, Ill.	1.33	1.21
C.R.&I.&P. Railroad		
Annawan, Ill.	1.02	.76
Geneseo, Ill.	1.08	.76
Wyoming, Ill.	1.05	.76
R.I.S. Railroad		
Aledo, Ill.	1.02	
Wagner, Ill.	1.02	.76

ILLINOIS FREIGHT ASSOCIATION DOCKET

Docket IRC 511-500—Crushed stone, carload, from Joliet, Ill., to Lee and Shabonna, Ill. Present: $1.21 net ton plus Ex Parte 148. Proposed: $1.00 net ton plus Ex Parte 148; rate to expire December 30, 1947.

Docket IRC 511-499—Sand, mixed with slag, carload, from Chicago, Ill., and points taking same rates to St. Louis, Mo. Present: No specific rate published. Proposed: $2.08 net ton, minimum weight 90 per cent of marked capacity of car; rate subject to Ex Parte 148-162 increase.

Docket IRC 511-501—Limestone dust, minimum weight 90 percent of marked capacity of car, except that when loaded to full capacity, actual weight will apply, from Bellwood, Ill., to Lee and Shabonna, Ill. Present: $1.21 net ton plus Ex Parte 148. Proposed: $1.05 per net ton subject to Ex Parte 148; rate to expire December 27, 1946.

Docket IRC 511-502—Sand (except naturally bonded moulding, ground or pulverized sand), carload minimum weight 80 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply; but order will not be accepted for less than 80,000 pounds, when in open-top equipment and 60,000 pounds when in closed equipment, from Gary, Ind., to Lee and Shabonna, Ill. Present: $1.80 per net ton. Proposed: $1.05 net ton, plus Ex Parte 148; rate to expire December 27, 1946.

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- Longer Jaws
- Self aligning SKF Roller Bearings
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Only the highest strength alloys throughout, and have the ability to withstand the most severe strains and shocks—to deliver a uniform crushed product in large volume.

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. . . prevent costly burn-outs and shutdowns that result in serious loss of production.

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Unit Segments are easy to Install or replace.

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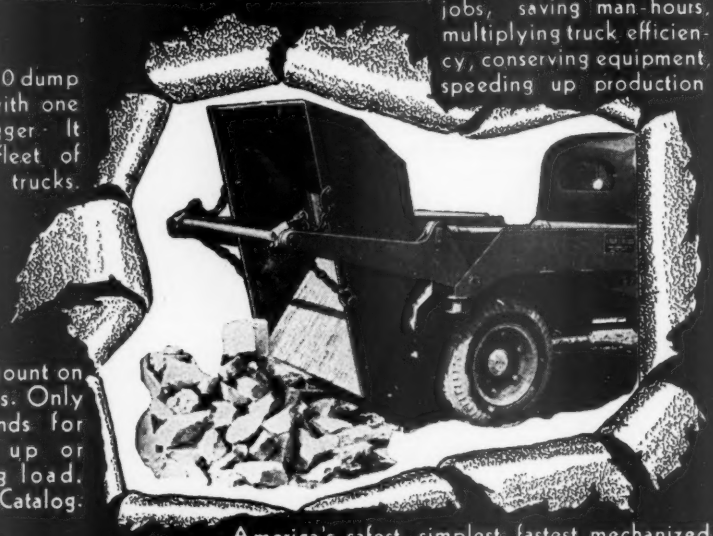

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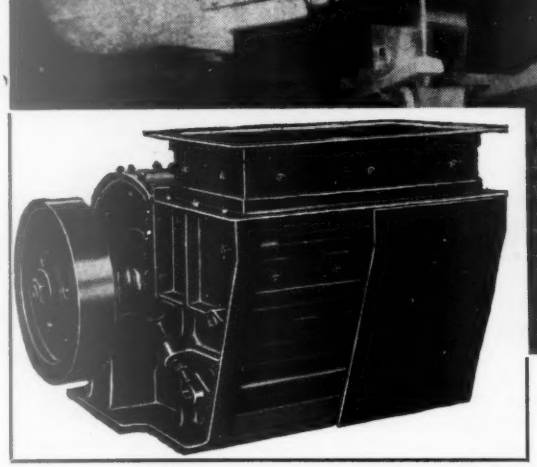

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Docket IRC 511-505—Slag, (refuse product of lead and zinc furnaces, having no commercial value for further extraction of metal), not pulverized, carload minimum weight 90 percent of marked capacity of car, except that when loaded to full visible capacity, actual weight will apply from Federal, Ill., to Joplin, Ill. Present: 260 cents net ton, subject to Ex Parte 148 increase. Proposed: 226 cents net ton, subject to Ex Parte 148 increase; rate to expire one year from effective date.

DOCKET AND STATUS REPORT OF PRIOR SOUTHERN FREIGHT ASSOCIATION SUBMITTALS

Docket 35914—Publish carload proportional rates in ton of 2,000 pounds on slag (without commercial value for the further extraction of metals) from Roanoke, Va., to Greensboro, N. C., as follows: 90 cents when originating at Bethlehem, Pa.; 33 cents when originating at Sparrows Point, Md. (Carrier.)

Docket 36003—On ground or pulverized clay, not otherwise indicated by name, carload, established rate of 600 cents net ton from Macon, Huber, and Reids, Ga., also Bath-Langley, S. C., Group to Beaumont, Bellaire, Houston, Magazine Spur, Medio, Pierce Junction, Stella, Streets Spur and West Junction, Texas. (Shipper; suggested by carrier.)

Docket 36005—Publish rates on sand, gravel, crushed stone, etc., carload, as described in item 300-E of Hoke's Tariff 388-F, I.C.C. 840, from Sherwood, Tenn., to Kasserman, Tenn., of 50 cents and to St. Andrews, Tenn., of 40 cents ton of 2,000 pounds. (Shipper; suggested by carrier.)

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 40070 (1)—Lime, Limedale Spur, Ark., to points in Iowa and Missouri. Pro. 40070.

To establish rates of 19 cents, minimum 30,000 pounds, and 15 cents, minimum 50,000 pounds, on lime, carload, from Limedale Spur, Ark., to Keokuk, Ia., and other points taking Group 1231, Western Trunk Line Tariff 368-B.

Docket 40071 (1)—Crushed stone, points in Colorado, to Amarillo, Tex. Pro. 40071.

To establish rate of 302 cents per ton of 2,000 pounds on stone, crushed, (ranging in size up to 200 pounds), carloads, minimum weight 90 percent of the marked capacity of car, except that when car is loaded to full visible capacity, actual weight will govern from Berthoud, Lyons and Wilds Spur, Colo., to Amarillo, Tex.

Docket 40081 (1)—Silica sand, points in Missouri, to Fairfield, Ia. Pro. 40081.

To establish rate of 242 cents per ton of 2,000 pounds on silica sand not ground or pulverized, carloads, minimum weight 90 percent of marked capacity of car, except that actual weight will govern when car is loaded to full visible capacity, from Crystal City, Festus, Ludwig and Pacific, Mo., to Fairfield, Ia.

Docket 40082 (2)—Silica sand, Everton, Ark., to Alton, Ill. Pro. 40082.

To establish rate of 265 cents per ton of 2,000 pounds from Everton, Ark., to Alton, Ill., on silica sand, carloads, in box cars or covered hopper cars.

SOUTHWESTERN FREIGHT BUREAU DOCKET

Docket 40221 (1)—Gypsum rock, Highland and Murfreesboro, Ark., to points in Kansas. To establish on gypsum rock, mine run, or crushed (not ground) carload minimum weight marked capacity of car, from Highland and Murfreesboro, Ark., to Iola, Chanute and Humboldt, Kan., 16 cents and to Independence, Kan., 15 cents per 100 pounds.

Docket 40226 (1)—Crushed gypsum rock, Fairview and Voorhees, Okla., to Ada, Okla. To establish rate of 8 cents per 100 pounds minimum weight 90 percent of marked capacity of car on crude gypsum rock, carloads, from Fairview and Voorhees, Okla., to Ada, Okla.

TRANSCONTINENTAL FREIGHT BUREAU APPLICATIONS

Docket 3234 (Shipper)—Gypsum rock, carload, EB: Request for rate $8.00 per net ton (no specific minimum weight proposed) from Arden, Nev., (Rate Basis 1) to Chicago, Ill., St. Louis, Independence, and LaSalle, Mo., Waco and Dallas, Tex., Tariff 3.

TRUNK LINE ASSOCIATION DOCKET

Docket 43773—(Originated by shipper) Slag, unsuitable for further extraction of metals, carload, minimum weight 90 percent of marked capacity of car, etc., from South Amboy, N. J., to Youngstown, O., $2.75 per net ton, in lieu of current 6th Class rate of 33 cents per 100 pounds.

Docket 43780—(Shippers) Clay, fire crude or ground, carload, minimum weight 60,000 pounds, from Dean and Harbison, Walker No. 8, Pa., to Bethlehem, Pa., and intermediate points on C.R.R. of N.J., Chestnut Ridge Railroad, L.&N.E. Railroad, L.V. Railroad, Reading Co., and P.R.R., $3.15 per net ton. Reason: Comparable with rates applying from other points in immediate vicinity.

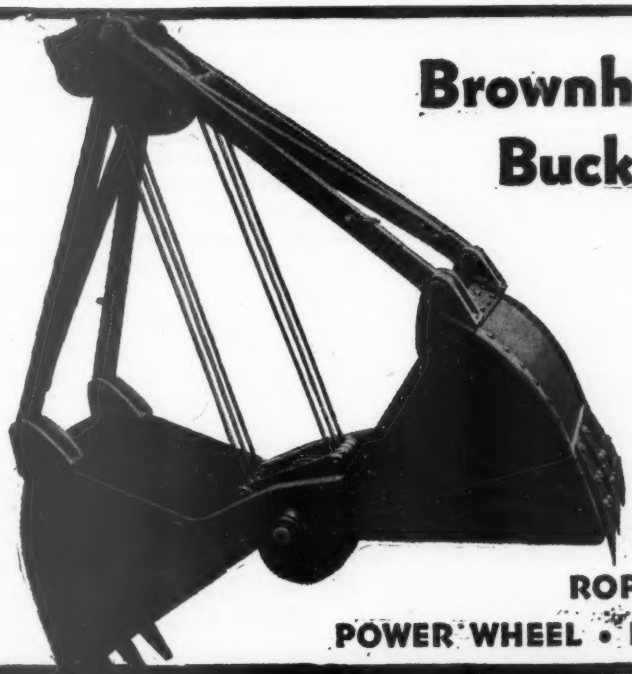
Docket 43802—(Shippers) Slag, unsuitable for the further extraction of metal, not granulated, in bulk, carloads, minimum weight 90 percent of marked capacity of car, etc., from Buffalo, N. Y., to Bedford Hills, N. Y., $2.86 per net ton, in lieu of current commodity rate of $3.30 per net ton. Reason: Comparable with rates applying to other points in immediate vicinity.

Docket 43811—(Originated by shippers) Slag, unsuitable for the further extraction of metal, not granulated, carload, minimum weight 90 percent of marked capacity of car, etc., from Sparrows Point, Md., to White Sulphur Springs, W. Va., $2.31 per net ton, in lieu of current 6th Class rate of 26 cents per 100 pounds. Reason: On same basis as rates applying from and to other points.

WESTERN TRUNK LINE NEW APPLICATIONS

Docket D-25-180—Lime, as described in Item No. 5, Western Trunk Line Tariff No. 368-B, carload. From Limedale Spur, Ark., to points in Iowa and Missouri taking Group 1231 basis. Proposed: Establish a rate of 19 cents, minimum 30,000 pounds and 15 cents, minimum 50,000 pounds (subject to Tariff X-148 increase). (By shipper.)

Docket E-41-781—Stone, crushed (broken stone), ranging in size up to 200 pounds



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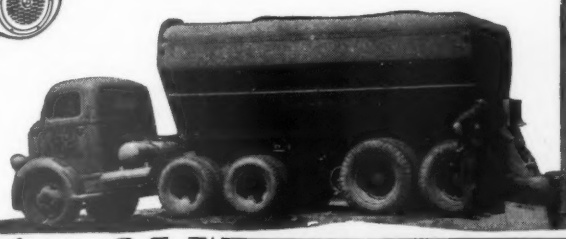

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in weight, carloads, minimum weight 90 percent of the marked capacity of car, except that when car is loaded to full visible capacity, actual weight will govern. From Berthoud, Lyons and Wilds Spur, Colo., to Amarillo, Tex. Proposed: 302 cents per ton of 2,000 pounds. (By shipper.)

Docket E-41-72—Stone, natural, other than bituminous asphalt rock, viz.: granite, jasper, marble or onyx, in blocks, pieces or slabs, rough quarried, or sawed four sides or less, not further finished. Stone, other than granite, jasper, marble or onyx, in blocks, pieces or slabs, rough quarried or sawed four sides or less, not further finished, carloads, minimum weight 90 percent of the marked capacity of car, except that when loaded to full visible capacity, in which event actual weight will apply. From Wisconsin Rapids, Wis., to Chicago, Ill. Proposed: (1) 8½ cents and (2) 10 cents per 100 pounds. (1) Rate applies only to facilities on the C.&.N.W. Railroad or to point of interchange with connecting lines. No switching charges will be absorbed. (2) Rate applies only when for delivery on connecting lines (Shipper.)

WESTERN TRUNK LINE NEW APPLICATIONS

Docket E-41-780—Stone, crushed, carload. From Atchison, Kans.,

Proposed rates via C.B.&P.

To	
Cambridge, Neb.	232
Crete, Neb., Lincoln, Neb.	114
DeWeese, Neb.	184
Dorchester, Neb.	154
Enders, Neb.	262
Falls City, Neb.	55
Hebron, Neb.	174
Indianola, Neb.	242
Louisville, Neb.	106
Nebraska City, Neb.	93
Seward, Neb.	159
Superior, Neb.	132

Rates in cents per 2,000 pounds.

Docket E-203-52—Slag (refuse product of open hearth furnaces, having no commercial value for further extraction of metal) other than granulated, not screened, in bulk in open-top cars. Minimum weight 90 percent of marked capacity of car used, but not less than 70,000 pounds. From Whiting, Ind., to Merton, Wis. Proposed: $1.49 per net ton. (By shipper.)

Docket E-41-773—Sand, carload, as described in Column B, Item 25, Western Trunk Line Tariff 41-A. Minimum weight as provided in Item 25, Western Trunk Line Tariff 41-A. From Muscatine, Ia., to Cadillac, Mich.; proposed—297 cents per net ton. (By shipper.)

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FOR SAND, GRAVEL STONE, ETC.
Manufactured exactly to your specifications.
Any size or style screen, in thickness of steel wanted with any size perforation desired.
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Preferred...SCHAFFER *for* POIDOMETERS

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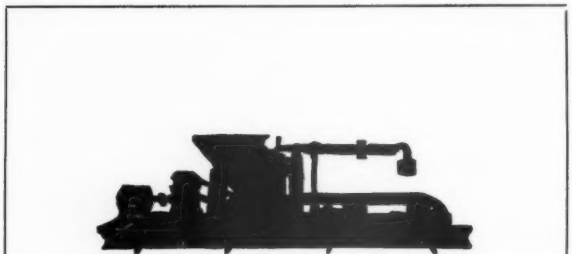

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Trade Literature

The pieces of literature listed below can be obtained direct from the manufacturers named, or requests can be addressed to Pit and Quarry's "Service to Readers" Department.

Q-Chromastic Plastic Super-Refractory Surfacing Mortar. Bulletin 315E, 4 pages. Quigley Company, Inc., 527 Fifth Avenue, New York, N. Y.

Double Impeller Stone Crusher, Model 3030. Bulletin 652. 12 pages. New Holland Machine Company, New Holland, Pa.

Cinder Crushing Machinery with Plus Value. Form 509. New Holland Machine Company, New Holland, Pa.

Aerotec Integral Dust Collector. Bulletin 310. Thermix Engineering Company, Greenwich, Conn.

Flexseal Hose Joint (Catalog section 3225) and Armorite Dredge Sleeves (Catalog section 3700). The B. F. Goodrich Company, Akron, O.

The National Use-Safe-Line Wire Rope Clamps. National Production Company, 4550-66 St. Jean Street, Detroit, Mich.

Water Hose (Catalog section 4800) and Suction Hose (Catalog section 4600). The B. F. Goodrich Company, Akron, O.

Hertner Completely Automatic Battery Charging Equipment. Price List No. 544-A, June, 1946. Covers prices for equipment, subject to a 16½ percent increase, in accordance with O.P.A. Revised Maximum Price Regulation No. 136, Order No. 624, above previous prices. The Hertner Electric Com-

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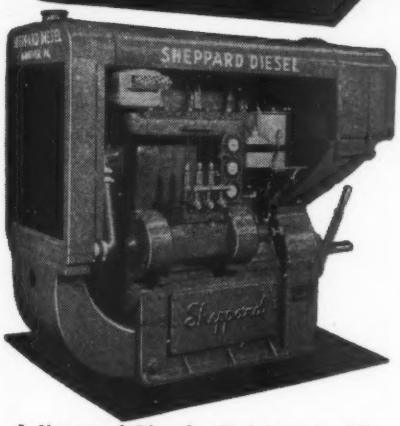

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13 Middle St., Hanover, Pa.

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PIONEER GIVES YOU EXTRA MARGINS OF PERFORMANCE. 4 pages. Pioneer Engineering works, Minneapolis, Minnesota.

LOWER-COST HAULING ON THE HIGHWAY. 3 pages. M-R-S Manufacturing Company, Jackson, Mississippi.

SYNTRON ELECTRIC TOOLS, CATALOG 464. Syntron Company, Homer City, Pennsylvania.

THE NEW CATERPILLAR BULLDOZERS, No. 8A, No. 7A. Caterpillar Tractor Company, Peoria, Illinois.

DENVER BALL-ROD MILLS. Bulletin No. B2-B6. Denver Equipment Company, Box 5268, Denver 17, Colorado.

PACKAGING PICTURE — THE STORY OF BEMIS MULTIWALL PAPER SHIPPING SACKS. 16 pages. Bemis Bro. Bag Company, Peoria, Illinois.

SHAFER BEARINGS IN DOWNERS GROVE. Shafer Bearing Corporation, 1412 West Washington Blvd., Chicago 7, Illinois.

WILEY MANUFACTURING COMPANY. Bulletin No. 44. 44 pages. Wiley Manufacturing Company, Mountville, Pennsylvania.

RAYMOND PULVERIZING AND SEPARATING EQUIPMENT. 8 pages. Bulletin 52-A. Raymond Pulverizer Division, Combustion Engineering Co., Inc., 1315 N. Branch St., Chicago, Ill.

ARMORITE DREDGE SLEEVES. Catalog section 3700. FLEXSEAL HOSE JOINT. Catalog section 3225. The B. F. Goodrich Company, Akron, Ohio.

RECENT BOOKS

BALL AND ROLLER BEARING ENGINEERING. *By Arvid Palmgren, Dr. Eng. 270 pages. Published by SKF Industries, Inc., Philadelphia.* A fundamental text, translated from the Swedish by Gunnar Palmgren and Bryce Ruley. Emphasis is upon fundamental principles, rather than upon specific problems. A knowledge of higher mathematics is not required for interpretation. Bearing types described are representative and subject to standardized manufacture. Examples of bearing applications are typical of representative designs.

JOB PLACEMENT OF THE PHYSICALLY HANDICAPPED. *Clark D. Bridges. Published by McGraw-Hill Book Company, Inc., New York. Price, $3.50.*

Prepared by a safety instructor in the War Training Program at the Illinois Institute of Technology. Approval offer for 10-day inspection period.

HOW TO HANDLE LABOR GRIEVANCES. *294 pages. Price, $4.00. By Dr. John A. Lapp. National Foremen's Institute, Inc., Deep River, Conn.*

Treats of the following topics: background and history of grievance procedures; grievances and how to deal with them; outline of grievance procedures; grievance procedures in selected industries; problems of grievance procedures. An appendix contains 22 grievance forms used by leading American corporations.

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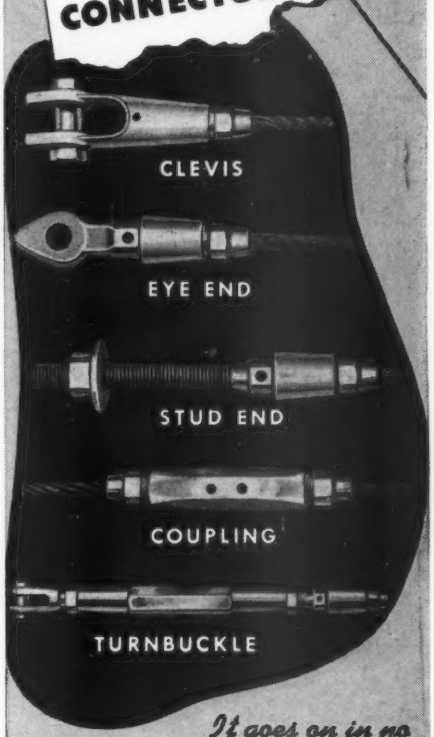
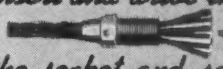


It goes on in no time — and hangs on for all time: this simple, husky device. Simply put the cable end through the sleeve, spread the strands, *insert and drive in the plug,*  *apply the socket and set in tight. Through* *the ingenious inspection hole you can* *see by the twisted strands that the joint is perfect.*

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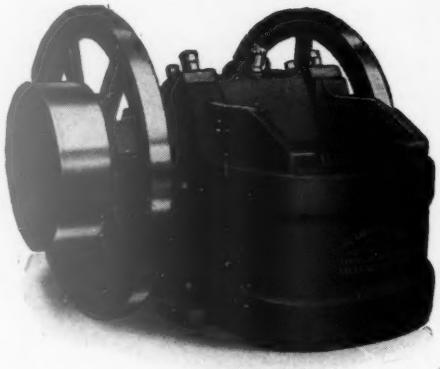

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Dowmetal Magnesium Alloys. 15 pages. Dow Chemical Co., Magnesium Division, Midland, Mich.

Silastic Silicone Rubber. 4 pages. Dow Corning Corp., Midland, Mich.

Simplicity Gyrating Screens. 8 pages. Fine Screening Bulletin No. 4. Simplicity Engineering Co., Durand, Mich.

STATEMENT OF OWNERSHIP

Statement of the ownership, management, circulation, etc., required by the Acts of Congress of August 24, 1912, and March 3, 1933, of Pit and Quarry, published monthly at Chicago, Illinois, for October 1, 1946.

State of Illinois, County of Cook, *ss.*

Before me, a notary public in and for the state and county aforesaid, personally appeared H. W. Baumgartner, who, having been duly sworn according to law, deposes and says that he is the business manager of Pit and Quarry, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the act of August 24, 1912, as amended by the act of March 3, 1933, embodied in Section 537, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher, Complete Service Publishing Company, Chicago, Ill.; Editor Walter E. Trauffer, same; Managing Editor, Walter E. Trauffer, same; Business Manager, H. W. Baumgartner, same.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one percent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given).

Complete Service Publishing Company, Chicago, Ill.
Harry W. Baumgartner, same.
Ida A. Baumgartner, same.
Stanley A. Phillips, Evanston, Ill.
Florence S. Phillips, same.
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3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent. or more of the total amount of bonds, mortgages, or other securities are: (If there are none, so state.) None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the twelve months preceding the date shown above is.....(This information is required from daily publications only.)

H. W. Baumgartner,
Business Manager.

Sworn to and subscribed before me this 30th day of September, 1946.

(Seal) Raymond S. Schultz,
(My commission expires January 21, 1947.)

P

C

JA

November, 1946

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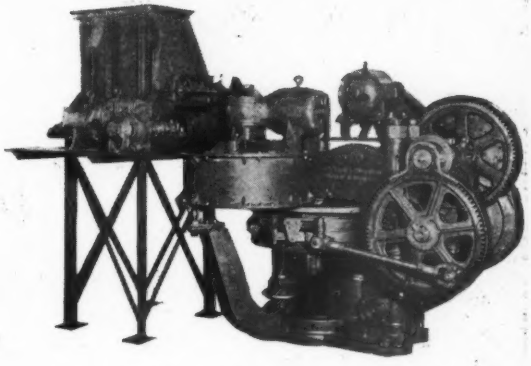
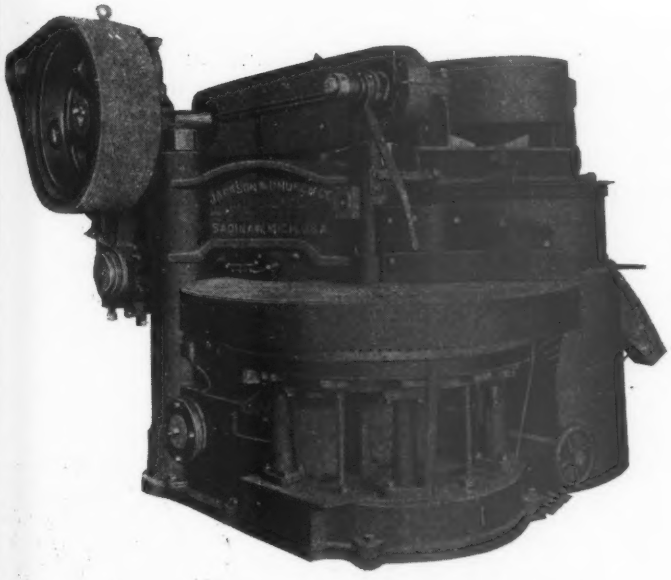


The smaller J&C Model NC Press produces 30 sand lime or concrete brick per minute.



J&C Model A Sand Lime Brick Press. Capacity, 60 bricks per minute.

J&C Brick Presses are basic machines in the drive to relieve national housing shortages.

These units are automatic, high-speed brick moulders, with adjustable, synchronized feed, and mould depth regulator.

They make accurately sized, smooth textured, high-strength brick, both facing and back-up types. No pallets required.

J&C Presses are built for long, continuous service and they insure record capacities of perfect brick, at minimum operating and upkeep cost.

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"WORK WELL DONE since '81"

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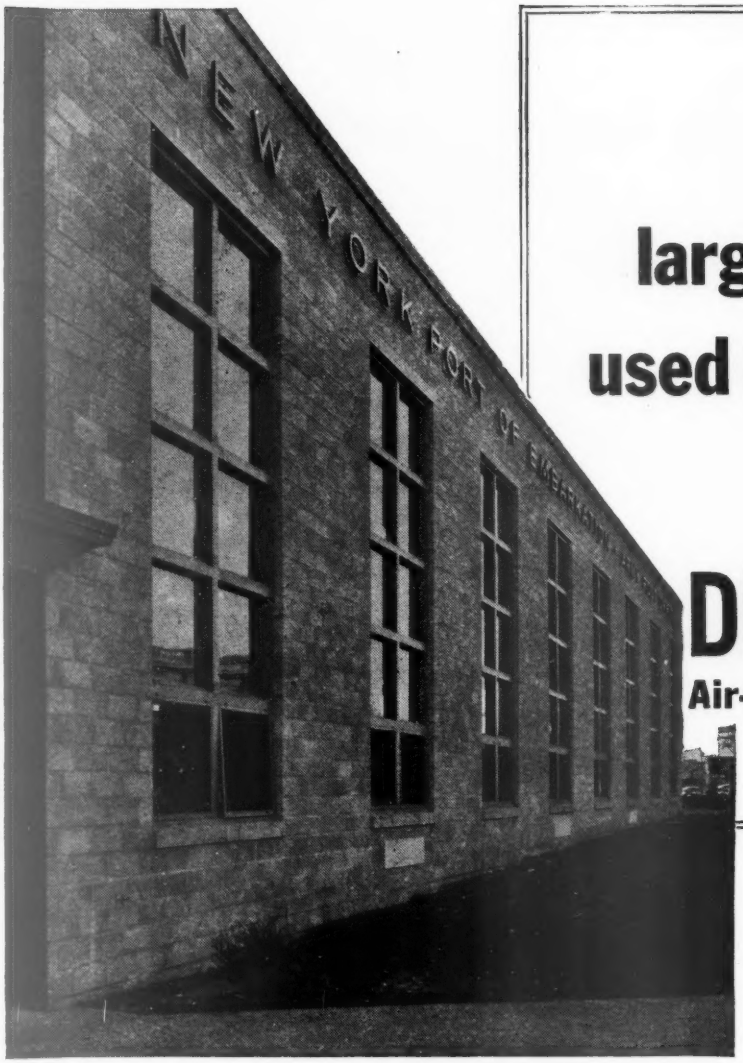

Army's largest "Mailbox" used block made with ATLAS DURAPLASTIC

Air-Entraining Portland Cement

Army Post Office, Long Island City, N. Y. Built under direction of Col. Edgar W. Garbisch, U. S. Army District Engineer; Alfred Hopkins and Associates, New York, architects-engineers; John A. Johnson Contracting Corp., Brooklyn, N. Y., contractors; concrete block by National Brick Corporation, Long Island City, N. Y.

Thousands upon thousands of superior concrete block . . . made with Atlas Duraplastic air-entraining cement . . . went into this massive, 14½-acre project.

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"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel—Sunday Evenings—ABC Network*

The CONCRETE MANUFACTURER

NOVEMBER, 1946

Vol. 10 No. 5

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Dienhart, Lynde Urge Use Of Concrete Masonry Units To Speed Home Building

"Three times as many new homes could be built today if concrete masonry walls were used along with the present available lumber." This was one of the startling statements made by leaders of the concretee industry recently. Deane R. Lynde, president, and E. W. Dienhart, executive secretary, of the National Concrete Masonry Association, addressing members of the Houston (Texas) Concrete Masonry Association, declared that there is no shortage of concrete masonry units and urged a more widespread use of this building material.

"A wall constructed of concrete masonry units can be erected in about half the time that is required to build a brick wall of the same size," stated Mr. Dienhart. He added that concrete units are termite-proof and fire-safe. The two officers of the national association stopped at Houston while making a tour of American industrial cities.

Officers of the newly-formed Houston organization are as follows: R. L. Rowan, president; B. M. Craig and G. W. Smith, vice-presidents; P. A. Kahle, secretary; R. W. Ford Jr., treasurer; L. H. Jolley, publicity chairman.

Pipe Machines Installed at Plants in West, Southwest

Several plants producing concrete pipe for irrigation and general purposes in the Southwest and on the Pacific Coast have recently installed 1946 model Martin packer-head pipe machines, according to F. E. Stewart of the Martin Iron Works, Los Angeles.

At Phoenix, Arizona, the Six Points Lumber Company and the Hopper Concrete Pipe Company have Martin machines in operation. The Warren Donaldson plant at Fort Worth, Tex., and the San Diego plant of the American Pipe and Construction Company also have started producing pipe on new Martin machines.

The Co-Val Concrete Pipe Company of Coachella, Calif.; Fowler and Myers, Somis, Calif., and Michael Lacasella of Yuba City, Calif., are preparing to install similar equipment.

C. P. A. Forecasts Huge Block Output for 1946

The Civilian Production Administration has released unofficial estimates of recent concrete and cinder block production which show a rapid and unbroken increase from 55 million in the first quarter of 1945 to about 194 million in the second quarter of 1946. A tentative forecast puts the third quarter output at 255 million blocks. C.P.A.'s guess for the entire year's production is about one billion units. This figure is considered justifiable by the National Concrete Masonry Association.

If block production should reach a total of one billion during 1946, this would be twice the output of the peak year, 1941, and would equal the combined production of all concrete and clay structural units for the same year. Several manufacturers are producing at a rate close to 10 million units.

C. C. Oleson Joins P. C. A. As Research Engineer

Calvin C. Oleson, professor of civil engineering at South Dakota State College at Brookings, resigned from his duties after 10 years with the institution to accept a position with the Portland Cement Association in Chicago on September 1. As research engineer for the association, Mr. Oleson will investigate the design, manufacture and use of concrete in all types of construction in the United States. He will be associated with F. R. McMillan, director of research for the Portland Cement Association, Dr. A. Allan Bates, vice-president in charge of research, and Ivan L. Tyler, manager of field research.

Mr. Oleson served with the U. S. Army Corps of Engineers from September, 1943, to September, 1945. He was district concrete engineer assigned to the Pennsylvania Turnpike project and was also employed by the highway departments of Iowa, Missouri and Pennsylvania.

A change of name has been announced by the Wetzstein Concrete Company of Lake View, Ia. The firm will be known as the Lake View Concrete Tile Company. In addition to tile, the company makes concrete culvert pipe and block

Coming Events

January 27-30, 1947 — Chicago. 28th annual convention, Associated General Contractors of America, Inc., Stevens Hotel.

February 17-20, 1947 — *Chicago.* Annual meeting and exhibit, National Concrete Masonry Association, Hotel Sherman.

March 5-7, 1947 — Los Angeles. 17th annual convention, National Ready Mixed Concrete Association, Biltmore Hotel.

Higher Prices for Four Types of Building Materials Follow Freight Increases

Increases in the delivered prices for four categories of building and construction materials reflecting government approved rail freight increases were authorized recently by the Office of Price Administration.

The action, effective September 23, 1946, affects clay and shale building brick (common, glazed and face), structural clay tile, clay drain tile produced by other than vitrified clay sewer pipe manufacturers, and sand lime brick.

In each case, except for clay drain tile produced in Ohio, Michigan and western Pennsylvania, the increase reflects the actual dollars-and-cents freight increase approved by the Interstate Commerce Commission and state regulatory agencies since July 1, 1946. These increases may be computed automatically by the manufacturer.

The freight rate increase, approved by the I.C.C., amounts to an advance of 11.3 percent in the Official Classification Territory, which is roughly the area of the northeastern United States. The advance in freight was set at 6 percent elsewhere.

Striking DC Drivers Return Under New Wage Contract

A strike of ready-mixed concrete truck drivers which had hampered construction in the District of Columbia for more than two months ended on September 19 with the drivers in possession of a new compromise contract granting an increase of 15 cents per hour.

The 160 truck drivers who had left their jobs at six concrete plants resumed their work at once. Their original demand was for a rise of 35 cents an hour. The signers for the companies included the Super Concrete Company, The Maloney Concrete Company, the Howat Concrete Company, the Patuxent Sand Company, the District Concrete Company and the Virginia Concrete Company.

Thick Concrete Walls Protect Against Broad-Beam X-Rays

As reported in the August issue of the *Journal of Research* (RP1735), concrete walls 51 inches thick will provide protection against 2,000,000-volt broad-beam X-rays, and walls 36 inches thick will protect against rays of 1,000,000 volts at 4 feet from the source and with a current of 3 milliamperes. These thicknesses represent approximately the most severe conditions that may be encountered. At greater distances and with smaller currents, walls correspondingly less thick will afford satisfactory protection.

Previous research had been directed toward protection from narrow beams, which react in a manner entirely different from that of the broad beams used in industry. Accordingly, an American Standards Association committee, headed by George Singer of the National Bureau of Standards X-ray Section, undertook the development of a safety code for the industrial use of X-rays. This code has now been adopted as an American War Standard, Z54.1-1946. The committee represented industry, labor, hospitals, medical schools, insurance companies and government agencies.

Interlocking Blocks Now Being Made in Illinois Plant

Interlocking concrete blocks of the type popular on the Pacific Coast are now being produced at Springfield, Ill., in a new plant recently opened by the Mortarless Masonry Company of that city. Partners in the new venture are Elbert D. Barrett and Gordon L. Ytell. The plant is equipped with two power-operated machines made by the Mortarless Tile and Machine Company of Los Angeles.

Besides producing the units, Messrs. Barrett and Ytell will serve as sales representatives in the entire state of Illinois for the Mortarless machines.

Iowa City Firm Operating In New $75,000 Plant

At Iowa City, Ia., the Central Ready-Mixed Concrete Company has opened its new $75,000 plant, which will increase the firm's producing capacity about 250 percent. The main part of the new plant has a four-compartment bin with a capacity of 150 tons of sand and gravel and 67 tons of cement. The largest of the company's trucks can be loaded from the main bin in 30 seconds.

6,000 Pumice Units Made Daily at Sacramento Plant

Approximately 6,000 light-weight pumice concrete blocks are produced daily at the new plant of the Sacramento Pumice Brick and Tile Company, Sacramento, Calif. Frank R. Hamblet, president and manager of the company, developed the block at Klamath Falls, Ore., in 1937. He obtained the pumice from his deposits at Glass Mountain in California.

Products Assn. Formed By 60 Members of Industry In Washington-Oregon Area

Members of the Associated Concrete Products Manufacturers of Oregon and Washington recently elected Phil Zaugg of Tacoma as president of the organization. Other officers chosen included the following: Floyd Martin of Portland, vice-president; Homer Bergren of Seattle, secretary-treasurer; and Pat Blair of Seattle, manager. Trustees are Thomas Nash, Talbot Campbell, Phil Zaugg, Scotty Wilson, Floyd Martin, John Ashe Sr., W. P. Hews, W. R. Jackson, Leonard Lamping and Carl Warren.

The new organization, which numbers about 60 members, plans to unify industrial relations programs and policies in the industry. The members employ about 5,000 persons.

Sioux Falls Manufacturers Give Homeless Vet a Break

Despite a decision of the South Dakota Concrete Products Manufacturers Association to discontinue selling concrete blocks "until such time as relief is forthcoming from the OPA," two Sioux Falls firms will produce and sell masonry units at current OPA prices.

Bill Gage, part owner of the Gage Brothers Concrete Blocks Company, stated that the firm was still able, because of quantity production, to make a small margin of profit and that output would continue to help fill the demand of veterans in need of homes.

Arnold Josten of the Josten Concrete Products Company, who is treasurer of the state Concrete Products Manufacturers Association, made a similar announcement.

Idaho Block Concern Plans To Enlarge Products Line

At the Lewiston, Ida., plant of the Concrete Products Company operators are turning out three masonry blocks every 20 seconds. Two types of products are made, one of sand, gravel and cement and one containing pumice; both kinds are made in three sizes: 8 by 8 by 16 inches, 8 by 12 by 16 inches and 8 by 4 by 16 inches.

The staff includes W. J. Houser, owner and operator; Adrian McMurray, foreman; James Edwards, assistant plant manager; Stan Lafrenz, consulting engineer. Monty Nelson is in charge of the mixing operation. Both the mixer and the block machine were supplied by the Besser Manufacturing Company. The management plans to expand its capacity in the near future. Parts of a pipe machine are already being installed.

The Concrete Pipe & Products Association of Seattle, Wash., has re-elected Fred M. Kettenring as president, with J. R. Sherman, of Yakima, vice-president and W. S. Wilson, of Olympia, secretary-treasurer.

Two Concrete Specialists Open Products Plant at Portland

another ON THE SPOT report

THE NEW plant of the Smithwick Concrete Products Company, now nearing completion at Portland, Ore., is—as one would expect—one of the finest of its size to be found in the country. The expectation arises from the fact that its owners are two young men of wide experience in the proper use of concrete masonry, who chose to team up and erect the plant.

The co-owners, Carl Smithwick and Paul Klemens, are widely known in the industry. Mr. Smithwick has been a Portland Cement Association district engineer in the Pacific Northwest for a number of years, while Mr. Klemens had sold, serviced and supervised the installation of modern concrete-block-making machinery for the Besser Manufacturing Company for nearly a decade, having severed his connection with that firm only recently to become associated with Mr. Smithwick in the Portland venture.

• Cement and aggregate elevators and the bin structure being erected by the Smithwick Concrete Products Company.

The new plant, located in northeast Portland near the Columbia River, reflects care in design, layout and construction and features concrete-masonry construction, paved floor and yard areas, five ample curing rooms with closed "yard ends," and the use of bulk cement. All ingredients will be proportioned by weight.

A Besser Super Vibrapac machine will mold the units, off-bearing to be by air-operated hoist. Provision has been made for installing a second machine at some future date. The Besser mixer is served by a Butler four-compartment aggregates bin, a Butler bulk-cement plant, and Butler weigh-batching equipment.

Aggregates and cement will be received by rail, a spur track having already been installed. Clark power-operated lift trucks will handle the racks and, after curing, will load the cubed units into trucks.

Both gravel and lightweight pumice blocks will be produced. Full production is scheduled for late this year.

World War II Veteran Plans To Build Products Plant

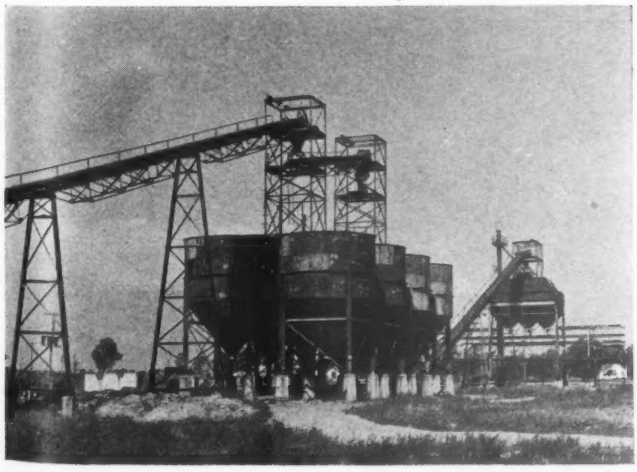
Lester R. Thompson was inducted into the U. S. Army in 1943 from Little Falls, Minn., and served with the 281st Combat Engineers for two years in the European theatre. He lost both of his legs above the knees in the explosion of a German mine in January, 1945.

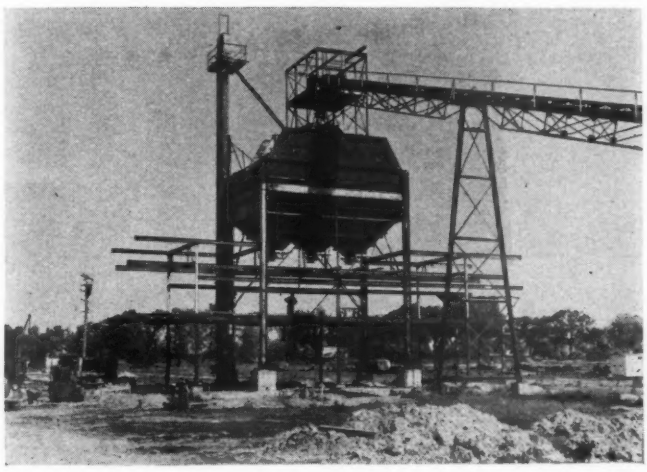
Loss of his limbs is no business handicap for Mr. Thompson, for he is president of the Thompson Holding Company, a corporation recently formed for the purpose of building a concrete block factory near Red Wing, Minn. Although at present unable to get materials with his veteran priority, he expects to start construction as soon as materials are available.

Lester R. Thompson

The factory will extend over an area of 600 by 200 feet, with structures to include a main plant and several storage buildings. About 40 persons will be employed; production is expected to be over 5,000 blocks a day.

• The illustrations below show the early stages of construction of the proposed Builders Company concrete block and ready-mixed concrete plant at Madison, Wis. Three Besser Vibrapac block machines, in addition to the ready-mixed concrete installations, will make this plant one of the largest of its kind in the country. Construction work is proceeding rapidly, and the plant is expected to be in operation by the middle of 1947.





New Plant of 50-Year-Old California Firm Streamlined for Efficiency

By HARRY F. UTLEY

another ON THE SPOT report

A NEW ready-mixed concrete plant that is a model of efficiency, flexibility, and high production capacity went into operation this fall at San Jose, Calif. The plant, which represents an investment of about $125,000 in land, structures and equipment, is owned by Borchers Bros. Building Material & Fuel Co., pioneer building supply concern of the Santa Clara Valley which is this year observing its 50th anniversary.

With one-man operation the new plant is capable of batching as much as 150 cu. yd. of concrete hourly and raw materials are never in short supply since the plant has a storage capacity of 1,000 bbl. of bulk cement, while up to 3,000 tons of aggregates in ground storage can be reclaimed *via* tunnel belt at the touch of a button from the operator's platform.

The Borchers plant is centrally located on a triangular plot of about seven acres lying alongside the tracks of the Western Pacific Railroad with

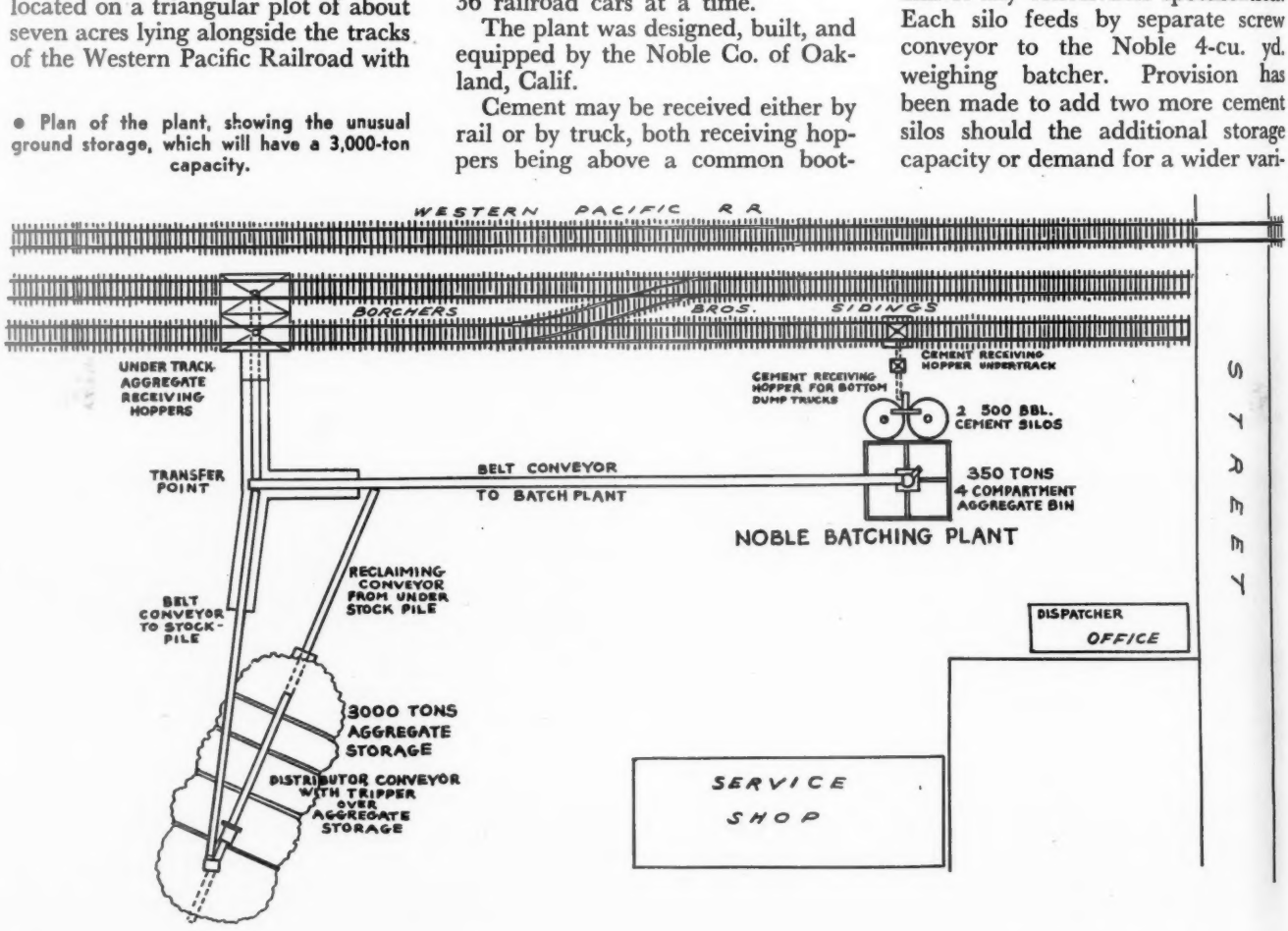
• A general view of the Borchers Brothers Material & Fuel Company's plant at San Jose, Calif., showing the conveyor housing leading to the ground storage (under construction, in the foreground).

double spur trackage for the receipt of bulk cement and aggregates which are purchased. The spurs are of ample length, accommodating up to 36 railroad cars at a time.

The plant was designed, built, and equipped by the Noble Co. of Oakland, Calif.

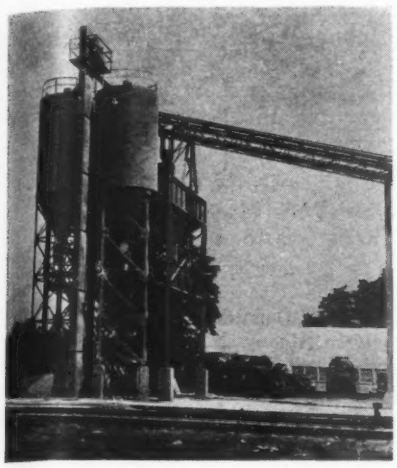
Cement may be received either by rail or by truck, both receiving hoppers being above a common boot-driven screw conveyor which transfers it to an enclosed elevator feeding the two cylindrical steel storage tanks, each having a capacity of 500 bbl. This twin-silo arrangement enables the company to have instantly available both regular and special cements to batch concrete to almost any conceivable specification. Each silo feeds by separate screw conveyor to the Noble 4-cu. yd. weighing batcher. Provision has been made to add two more cement silos should the additional storage capacity or demand for a wider vari-

• Plan of the plant, showing the unusual ground storage, which will have a 3,000-ton capacity.


WESTERN PACIFIC R.R.
BORCHERS BROS. SIDINGS
UNDER TRACK AGGREGATE RECEIVING HOPPERS
CEMENT RECEIVING HOPPER UNDERTRACK
CEMENT RECEIVING HOPPER FOR BOTTOM DUMP TRUCKS
2 500 BBL. CEMENT SILOS
TRANSFER POINT
BELT CONVEYOR TO BATCH PLANT
350 TONS 4 COMPARTMENT AGGREGATE BIN
NOBLE BATCHING PLANT
STREET
RECLAIMING CONVEYOR FROM UNDER STOCK PILE
BELT CONVEYOR TO STOCK-PILE
DISPATCHER OFFICE
3000 TONS AGGREGATE STORAGE
DISTRIBUTOR CONVEYOR WITH TRIPPER OVER AGGREGATE STORAGE
SERVICE SHOP

ety of cements make this advisable.

There are two track hoppers for receiving aggregates by gondola or hopper-bottom cars. These hoppers are of steel construction, have a capacity of about 1½ carloads each, and their sides slope steeply for complete emptying by gravity to a



• These two steel storage tanks together have a capacity of 1,000 tons of cement.

24-inch by 65-foot belt conveyor which operates at right angles to the tracks. This conveyor transfers its load to the main 24-inch by 240-foot plant conveyor which parallels the spur track and carries the aggregates up to the plant bin. The top edge of the bin is 48½ feet above ground level, it has a total capacity of 350 tons of aggregates, and is divided into four equal compartments, distribution to the proper compartment being by turnhead controlled from the batching floor.

The reserve supply of aggregates is to be held in ground storage, a 24-inch by 180-foot belt conveyor building up the piles, taking the aggregate from the conveyor transfer point previously mentioned instead of allowing it to go up to the plant bin. A tripper (also controlled from the batch plant floor) will drop the aggregate into the proper pile, four concrete bulkheads separating the different sizes. A 24-inch by 200-foot reclaiming belt, operating in a tunnel beneath the piles, can withdraw aggregates of the selected size, transferring them to the main belt serving the plant. The gates feeding the reclaiming belt will be air-ram operated and electrically controlled by the batch plant operator. All the conveyors are equipped with Hewitt "Ajax" belting.

Aggregates are batched manually, cement by automatic control, into the 4-cu. yd. weigh batcher. Double clamshell gates provide wide openings for fast flow into the batch box yet enable the cut-off to be fast and positive. The 5-beam Noble back-balanced scale (4 beams for aggregate, the 5th automatic for cement) is equipped with a full-vision indicator above for accurate measurement. A photo-relay, operated by the indicator in conjunction with the cement poise beam, operates louvre gates in the cement feed-screw discharge, the motors driving the feed screws being automatically started and stopped by the action of the louvre gates. The design of the cement discharge tube in the weigh batcher allows the aggregate to envelope the cement, minimizing dusting when the batch is dumped.

Water is measured from a calibrated tank located for convenience alongside the scale and batching levers.

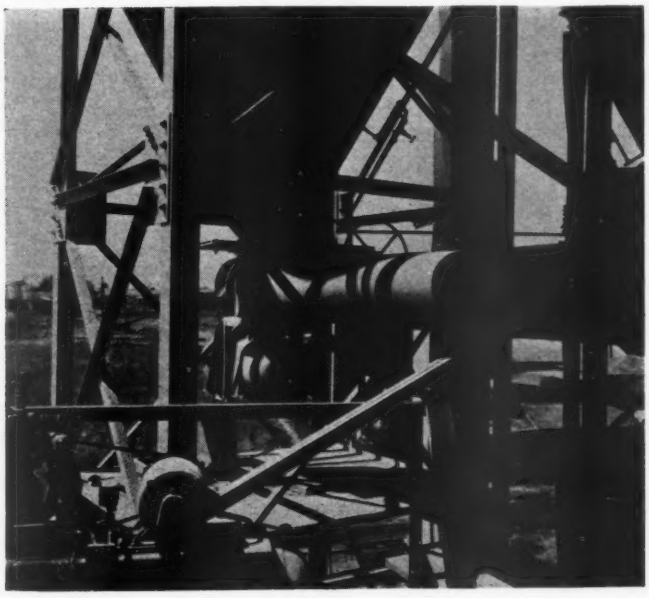
• The five-beam scale and levers which control the flow of aggregates.

Besides batching directly into the truck mixers, the Borchers plant is being equipped to pre-mix the concrete as well. A 4-cu. yd. revolving mixer being built by the company will be installed between bin supports beside the truck-mixer driveway. The mixer will be of the swing-away type to receive batches from the same spout which charges the truck mixers, yet will not interfere with the free movement of the trucks through the plant. While the mixer will probably supply fully-mixed or shrink-mixed concrete to the trucks where specifications so demand, the company is strongly considering the possibility of delivering at least a portion of its output in special dump trucks, using air-entraining cement to prevent segregation, thus following a trend which has been noted in other areas.

The Borchers company pioneered

• Below, left: The weighing hopper with clamshell gates for aggregates; automatic cement gate at the left.

• Right: One of the screws feeding cement from the storage silo to the batch box.



• The ground storage facilities for aggregates while under construction. Live capacity will be 3,000 tons.

truck-mixed concrete in San Jose 12 years ago when it purchased two truck mixers. Its present fleet totals 12, including Blaw-Knox, Jaeger, Rex, and Smith units. Eight of the trucks carry 4-cu. yd. mixers, the remaining four being 3-cu. yd. models. The last five purchased are of the high-discharge type. Until the new plant went into operation the truck-mixers were loaded at the Phelan Ave. bunkers of Pacific Coast Aggregates, Inc., on a lease arrangement with that concern.

The dispatcher's office is strategically located in a corner of the plant office building alongside the driveway used by incoming trucks. Arriving drivers are able to receive their delivery tickets through the dispatcher's window without leaving their cabs. While making the turn over the concrete-paved yard preparatory to entering the loading driveway, the dispatcher talks by intercommunication system with the batch-plant operator advising him of the proportions. Thus, by the time the truck-mixer is in a position to load beneath the weigh batcher, the plant operator has already batched the materials and the truck is able to be charged with the proper mix without delay.

The company subscribes to the theory that a clean truck is its best advertisement. Clean in the morning, each unit of the fleet is sprayed with a film of oil so that bits of concrete, dirt and dust which may accumulate during the day can be washed off with ease each night by simply flushing with a hose.

Any surplus concrete brought back by the truck-mixers is utilized in the production of pre-cast pier blocks for which there is a good demand. Steel forms arranged in line at a far corner of the yard make the filling of the forms via chute from the trucks possible and practical.

Besides supplying ready-mixed concrete the company also owns its own Mixermobile unit for mixing and elevating concrete on the job. On a recent project, the pouring of the walls and floors of the new J. C. Penney Co. store building in San Jose, the hoisting tower was extended to a record height of 75 feet for filling the topmost forms.

The Borchers Bros. Building Material & Fuel Co. was founded in 1896 by R. H. Borchers who retains an interest in the concern today and plays a semi-active role in its management despite his advanced years. Arthur W. Caldwell and Miss M. V. Chase are the other two partners, the former serving as general manager and the latter supervising the general offices in downtown San Jose.

• Several of the Borchers fleet of 12 truck mixers, which includes five of the high-discharge type.

New York Pipe Makers Hold Three Sessions in Albany

On Thursday and Friday, August 29-30, three meetings associated with the American Concrete Pipe Association were held in Albany, N. Y.: a regional meeting in conjunction with the Northeastern Concrete Pipe Association; a meeting of the Committee on Constitution and By-Laws; and a meeting of the association's Executive Committee. The success of these meetings provoked the suggestion that next year they be enlarged into a summer convention.

Guests at the regional meeting from New York State Department of Public Works were H. O. Schermerhorn, consulting engineer; C. C. Ahles, engineer of design; E. F. Gawkins, deputy chief engineer; and Ira Paul, director of the public works laboratory. Following a brief address by each of the guests, a general discussion of New York state concrete pipe specifications was held.

Clarification of the methods of appointing the executive committee, and officers and directors, clarification of the mechanics of signing checks for expenditures, were incorporated in a report made by chairman M. C. Kelly, J. A. Dunn, and W. E. Corbett, of the Committee on Constitution and By-Laws (approved by the executive committee). The report is to be submitted to Association Secretary E. H. Fox.

The executive committee met for its summer meeting with the following officers present: President, Elmer L. Johnson, Colton, Calif.; Past President, O. H. Miller, Memphis, Tenn.; Secretary, E. H. Fox, Cincinnati, O.; and Director, H. H. Dickehut, Austin, Tex. Also present at the meeting were Director M. C. Kelly of Buffalo, who gave a report of the Committee on Constitution and By-Laws, and Captain M. G. Roux, who gave his report as acting chairman of the subcommittee for concrete pipe of the Industry Advisory Committee for Ready-Mixed Concrete and Concrete Products. Captain Roux also reviewed, in detail, industry negotiations with the Office of Price Administration. Activities of the association, since the April convention, were reviewed and approved.

When the executive committee had been adjourned, some of those present accepted the invitation of Secretary Charles W. Maxwell of the Northeastern Concrete Pipe Association to attend the races at Saratoga Springs.

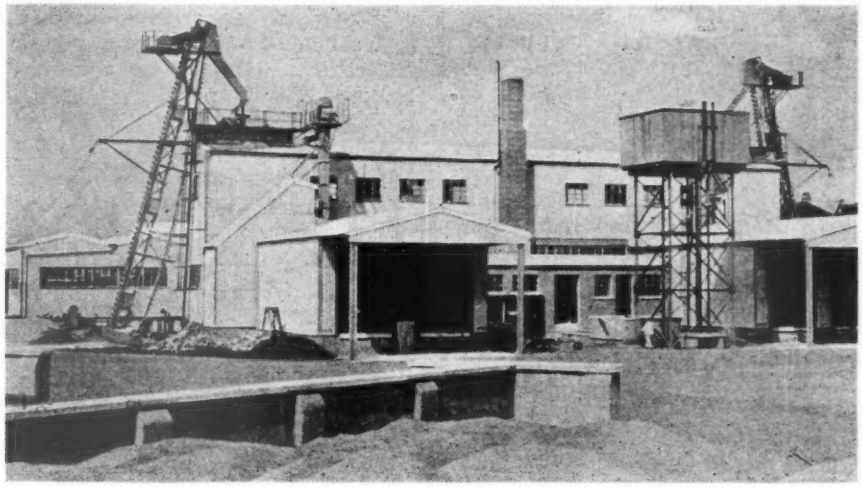
GLASGOW CORPORATION OPENS FOAM SLAG AND CONCRETE PRODUCTS PLANT

Unique Product Developed After Years of Research

THE Glasgow Corporation on August 9, 1946, opened its foam slag precasting factory at Amulree Street, Tollcross, Glasgow, bringing to fruition a scheme first propounded in practical form nearly three years previously. Designed to produce precast foam slag units for the complete fabrication of housing in the city, the completion of the factory had been delayed by a variety of contributing causes allied to the shortage of materials in the post-war period.

The plant is even yet incomplete, but is operating to a limited extent dispatching the first consignment of precast slabs to the adjoining housing scheme. It follows very closely, in layout and principle, the plans prepared when first the proposals were publicized. In the completion of these plans, however, a considerable variety of practical problems demonstrated themselves, in construction, and during the experimental period previous to the opening. The factory is therefore, in many ways, interesting, in that it incorporates a considerable number of components and gadgets designed specifically to meet the new production problems involved.

The layout of the plant consists of two complete units, side by side, each identical in design and sharing a single boiler plant located centrally in the rear. These two units each consist of a bucket elevator and boom scraper which carries aggregate to an elevated hopper and thence to a Winget "A.B.C." automatic belt-controlled cement-mixing machine, with a mixing capacity of 30 cubic yards per hour, to which cement is elevated from a rear cement store.



• A general view of the Glasgow Corporation's new plant at Tollcross, Glasgow. The foam slag aggregate pits are in the foreground. Also shown are the cement storage facilities, elevators, shops, boilerhouse and offices.

The mix is then fed into molds, via a hinged sheet iron filler, on a lower floor, and passed through a steam-heated curing oven. At the delivery end the molds are opened, the slabs extracted and stored against delivery to the housing site, where erection is by mobile crane.

The whole scheme presupposes a direct flow through the plant, to the scheme and during erection. It is perhaps possible that any limitation at the productive end may enforce idleness at the building end, while the reverse will also apply. That situation has not yet been determined by experience and present plans are to so gear production to erection as to limit any serious delay in either plant.

The aggregate elevators have horizontal boom scrapers at ground level scooping fine and coarse aggregate into a hopper, from which the bucket elevator scoops and carries to the upper story housing the mixers, the aggregate then feeding by gravity into the mixers. The booms operate in a semicircle. Additional storage capacity has been provided for accumulation of aggregate above that which can be accommodated in the two semi-circular storage bins proper.

Cement is brought in through the cement store in the rear of the plant. Bags are loaded on a cradle carried on an overhead runway and taken to a tipping platform where manual tipping into a hopper is used. A worm in the hopper carries the cement to the elevator shaft, which carries it to a point above the mixing plant. Water is provided by an elevated 10,000-gal.-capacity storage tank servicing the mixers and the boiler plant.

The two mixers have been specially designed for this work. They

• Left: Workers handling molds, showing hand-grips, side bolts and steel mesh in the steel frame.

• Right: The method of storing slabs of foam slag, which are secured to racks by special clips. (Note the overhead mechanical handling system.)

are A.B.C. automatic belt controller type, made by Winget, with a maximum capacity of 30 cu. yd. per hour. Materials are fed by means of adjustable belt feeders, to give any desired proportion within a given range.

Water is delivered through power-operated special-type meters, with a total maximum discharge of 28 gallons per minute, which control the volume permitted to any given mixing policy. Automatic control of the delivery of the four ingredients ensures that all are being delivered in correct proportion and simultaneously, thereby eliminating any possible failure in delivery.

All the feeders are positively connected to the mixing belt to avoid variations in speed between the mixing and feeder belts. Over the mixing belt which carries the material are one horizontal and two vertical spinners which ensure a perfect mix of the material during its passage along the belt.

The feeders deliver direct to the mixing belt, with an effective operating width of 21 inches, moving at a speed of approximately 13½ feet per minute. The two steel aggregate bins above each mixer contain approximately 30 tons of graded aggregate, with dam gates which control delivery into the feed hoppers. The mixer is electrically operated. Molds are of steel in frame form and with perforated steel side plates, a steel sole and three quick-release side catches on either side. The sole plate carries three bolts connecting the base and side frames of the mold. Reinforcement, spot welded in the plant in side welding shops, is inserted in these molds, which are then oiled and carried below the filling spout. The reinforcement frame is held centrally during filling by concrete blocks steaded on steel bars and by hand above.

Molds are conveyed throughout by a system of overhead runways and cranes while floor roller conveyors are used under the filling mouths for easy handling.

When filled, the mold is conveyed by traveling crane to one of eight steam curing chambers. The overhead system has automatic stops and locking gear, operated from floor level by pendant chains, to ensure alignment of the hand-operated overhead transporter cranes and the overhead hand runways.

The eight steam curing ovens run centrally through the plant and take approximately 30 to 40 molds each for 24 hours at approximately 1200 deg. F. Units are left in the ovens for 24 hours.

The steam is fed from a horizontal steam pipe in each oven floor, with outlets at 4½-ft. centers carried in a duct. Steam is fed from a water-tube boiler capable of 1,000 pounds of steam per hour.

A bank of 3-in. heating pipes along the full length of one side of each oven and connected to the main floor and return heating pipes in the floor ducts give dry heat—to raise initial temperature of curing ovens.

The dismantling section is fitted with four traveling cranes which connect with the curing oven runways. Molds are carried by crane and lowered in the mold removal bay in the open. The mold is opened and the slab extracted and carried on an overhead runway to any point in the storage bays, which are also in the open. There they can be either held erect by means of specially-designed clips which hold them plumb to the steel racks, or at a slight angle against the racks. The maximum period of storage might be one day. The stackyard has an approximate capacity of 12 houses, and care will obviously be taken to so arrange stacking and production as to ensure that complete houses in precast unit form are produced to a prearranged program.

The mold is then reassembled and carried back by the overhead runway to the filling point to again resume the cycle of filling, curing and dismantling.

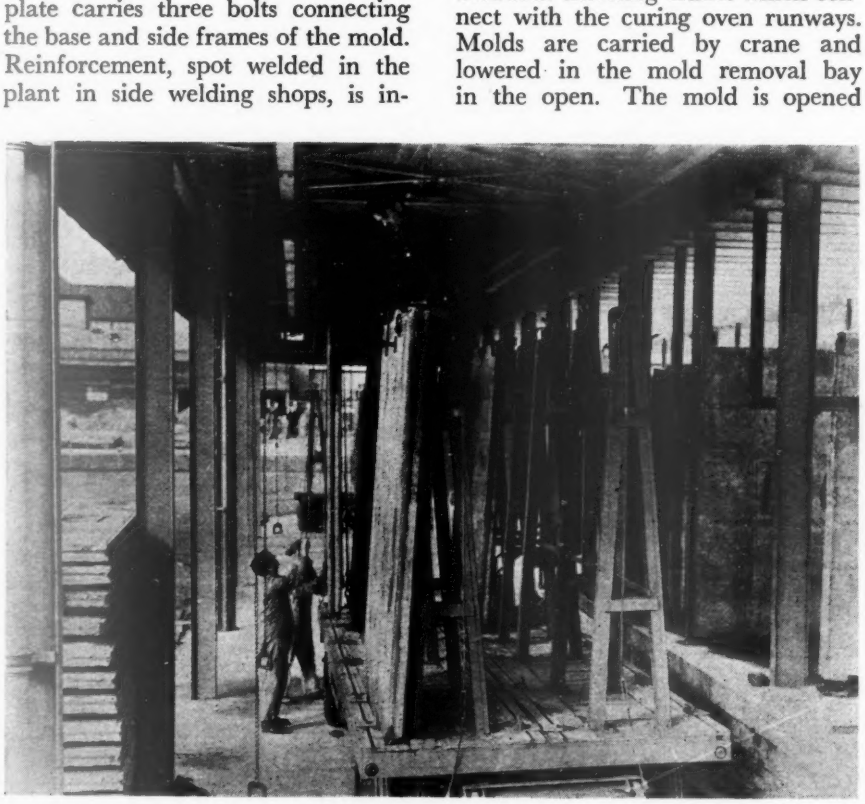
The two filling points will be used as necessity demands but one is intended as the point for wall sections up to 10 feet long by 8 feet 8 inches high and 6 inches thick for outer walls, and 4 inches for inner walls, while the other filling point will be devoted to angles, etc. The aggregate is soaked before mixing and British portland cement is used.

The mix in use is 4:3:1, the coarse aggregate is ½-in. to ⅛-in., and the fine aggregate is ⅛-in. to dust., an interesting point being that the sand in use is foam-slag sand.

The factory buildings are of steel-framed one-story construction, with asbestos cement cladding and roof sheeting.

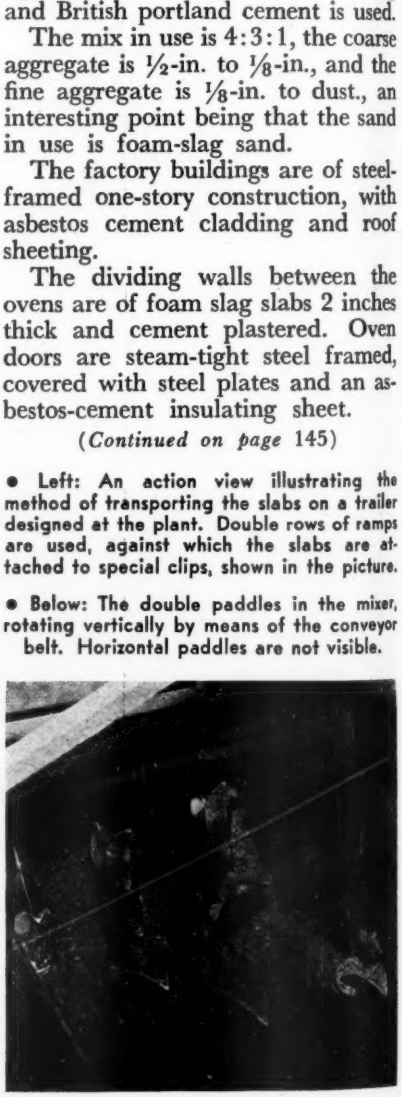
The dividing walls between the ovens are of foam slag slabs 2 inches thick and cement plastered. Oven doors are steam-tight steel framed, covered with steel plates and an asbestos-cement insulating sheet.

(*Continued on page* 145)



• **Left: An action view illustrating the method of transporting the slabs on a trailer designed at the plant. Double rows of ramps are used, against which the slabs are attached to special clips, shown in the picture.**

• **Below: The double paddles in the mixer, rotating vertically by means of the conveyor belt. Horizontal paddles are not visible.**



Research Group's Efforts Develop Two-Way Attack on Cinder Staining

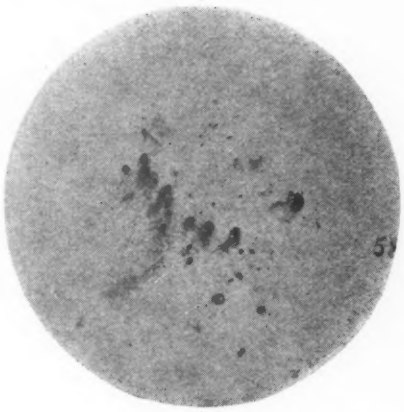
ALTHOUGH cinder aggregate for producing concrete masonry units generally has given highly satisfactory results, some cinders have shown a tendency after exposure to develop objectionable surface stains and pop-outs. These have become so serious that practical methods of minimizing the trouble have been developed. The problem applies particularly to exposed, painted or plastered walls of cinder concrete masonry where staining or pop-outs will be directly visible or may disfigure plaster or other finishes in contact with the masonry.

Tests conducted by the Development Department of the Portland Cement Association reveal that moist storage of cinders offers a positive means of reducing staining and pop-outs which may occur in cinder concrete masonry. From these tests it was indicated that products manufacturers who permit their cinders to remain in stockpiles in a moist condition for at least 30 days *after crushing* should encounter little trouble with either staining or the most prevalent type of pop-outs.

Tests were also conducted to determine whether some benefit might result from immersing the cinders in a lime bath containing approximately 2 pounds of hydrated lime suspended in 5 gallons of water. Results showed this method to be the most effective of any so far investigated from the standpoint of reducing the staining properties of cinders.

Although this method of treatment would entail somewhat greater cost than ordinary moist storage of cinders, the cost would not be prohibitive. It is possible that the cinders after being crushed to size could be sprayed with a dilute milk of lime at the time they are stockpiled and then maintained in a moist condition without further lime treatment. If a cinder does not respond readily to moist storage, the lime treatment may offer an effective means of rendering it satisfactory for use in the manufacture of concrete masonry units.

In the studies it was found that in nearly every case of staining the cause was traceable to iron compounds which existed in the cinders themselves and *not* to particles of tramp iron. While the removal of all tramp iron is desired and the practice of passing cinders over a magnetic separator is recommended, this procedure alone will not eliminate staining and pop-outs.

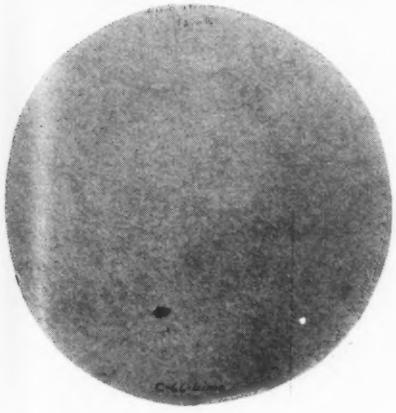


• Heavy staining, as shown in chart above, results in disfigured wall at right. Such a wall is poor publicity for cinder products.

In order to devise an effective means of quickly detecting the presence in cinders of those substances responsible for the development of staining and some classes of pop-outs, a simple and inexpensive method has been perfected by the Development Department which appears to be sufficiently accurate to furnish a means of studying cinder treatments, and which has the further advantage of being adaptable to testing and control in cinder block plants without laboratory facilities.

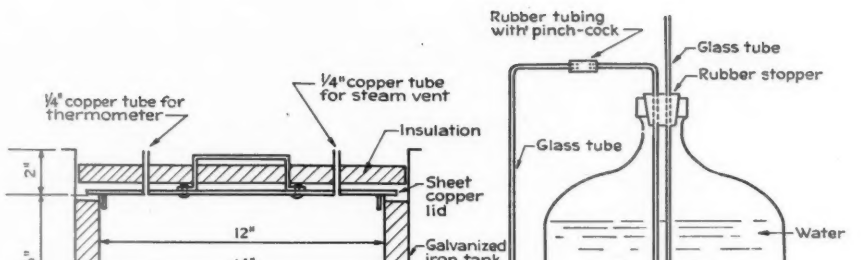
This method for detecting substances in cinders which may cause staining and pop-outs in concrete masonry applies only to the type of pop-outs caused by iron compounds. The test method does not provide for detection of particles of hard-burned lime in cinders which, if present, may also cause pop-outs.

• After proper lime treatment the samples come through the test without stain. (See stain chart below.) Concrete masonry units in which treated cinders are used will be as free of stain as the wall to the right, an understudy of the P.C.A. laboratory.



Test Apparatus The equipment used in conducting these tests consisted of an electrically heated vapor bath, including a five-gallon water bottle, which can be built for approximately $50; rubber tubing; several feet of glass tubing; filter paper; cheesecloth, etc. (See the following page.)

In the selection of cinders for testing it is recommended that the sample consist of cinders taken from several different locations of the stockpile. Cinders to be used in the staining test should be of the same size and gradation as those used in block production. Where plant practices include removal of iron by magnetic extraction before crushing, this practice should be followed in preparing the cinders for test purposes.



CIRCULAR VAPOR BATH

PORTABLE STAINING TEST APPARATUS

Test Procedure The principle involved in this method of testing is the exposure of the aggregate to water vapor at 212 degrees F. for 16 hours, while in contact with white filter paper. Many tests were made by varying the time element and it was found that the amount and intensity of stain produced on the filter paper in 16 hours was a good indication of the staining properties of the aggregate. The iron or iron compounds in the cinders which are responsible for stains and some types of pop-outs react to form the same products which produce stains in cinder concrete and these products are transmitted to the filter paper where they may be readily recognized.

The filter paper used in the tests should be a heavy, strong paper in circular sheets 33 centimeters (13 inches) in diameter, which may be obtained from any laboratory supply company.

The paper is first folded to form a cup-shaped receptacle 7 inches in diameter. A convenient method of doing this is to use a circular piece of heavy cardboard 7 inches in diameter as a form. Place this in the center of the filter paper, fold the edges of the paper toward the center and crease them. The paper is placed in the center of a piece of cheesecloth approximately 24 inches square and opened up. A layer of cinders, crushed to the size in which they are used in manufacturing block, is placed on the paper to a depth of about ½ inch. The same quantity of cinders should be used in all tests. This may be accomplished by providing a can or other receptacle which will hold the proper amount. In using filter paper of the size specified, approximately 32 cubic inches of cinders will be required to form a layer ½ inch thick.

The edges of the paper are then folded toward the center over the layer of cinders, another filter paper is placed on the top and process is repeated. A complete sample may consist of any number of layers and the use of not less than three layers is recommended. A small slip of paper with a number corresponding to the identifying number of the cinder sample may be placed on the top of the sample, or each filter paper may be marked with the proper number with a soft lead pencil.

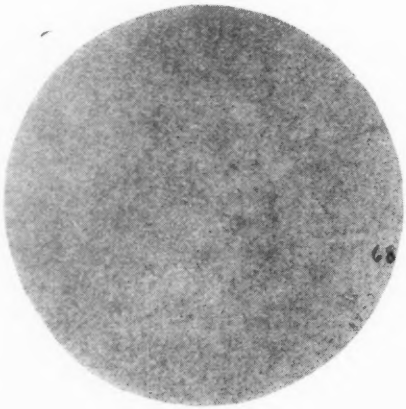
The corners of the cheesecloth are brought together, and the neck of the bag thus formed is tied with heavy cord.

The entire sample is immersed in water for a few seconds and is then placed on a rack, such as a piece of galvanized screen, and allowed to drain for 5 minutes.

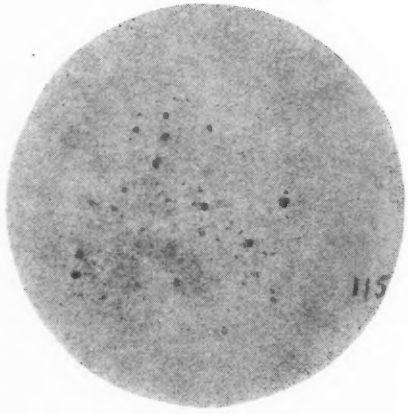
The sample is then placed in the vapor bath which has previously been heated to 212 degrees F. The cover is placed on the vapor bath, a thermometer is inserted in one of the two openings in the cover with the bulb just above the sample. Heating is continued. When the temperature shown by the thermometer reaches 212 degrees F., the heating is continued for 16 hours. Care should be taken to adjust the constant level reservoir to maintain a depth of at least 1 inch of water in the bath at all times.

After 16 hours of this steaming, the sample is removed from the bath, placed on a clean, flat surface and opened up. Each paper is carefully lifted and the layer of cinders

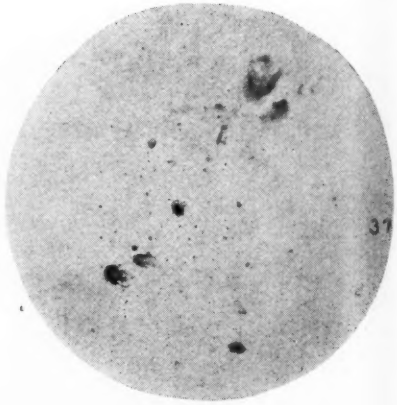
• The degree of staining caused by impurities in cinder aggregate classified into five groups.



Very light



Light



Moderate

is removed by scraping with a spatula or knife blade.

The remaining cinders are washed from the paper with clean water This is conveniently done by placing the paper on a piece of ¼-inch mesh galvanized wire screen to avoid tearing the paper, and washing it under a tap. The paper is then dried by hanging it on a cord.

Although there usually is some discoloration of the paper caused by fine particles of coal, coke or cinder dust becoming embedded in the pores of the paper, a little practice will enable the operator to recognize readily stains produced by iron. The majority of stains are a typical reddish brown in color and in some instances a green stain will be noted, which is produced by ferrous iron. Also, in a few cases, a black iron stain will be found on the paper.

The various colors produced on the filter paper will usually be reproduced on the surface of the cinder concrete masonry units, if cinders from the same stockpile are used. As an example, if a reddish brown color is found on the filter paper, it will usually also be found on the surface of the cinder concrete masonry units.

Staining Classification Based on the results of hundreds of samples of cinders subjected to 16 hours of vapor bath, the amount and intensity of the stain produced on the filter paper is an indication of the staining properties of the sample.

This visual method of obtaining the amount and intensity of the stains thus produced has resulted in establishing five graduated classes of staining. Each class has been assigned a numerical number called the "stain index".

The "class" and "stain index" of cinder samples exposed to 16 hours vapor bath are as follows:

Class	*Stain Index*
Very Heavy Stain.....	100
Heavy	80
Moderate	60
Light	40
Very Light	20

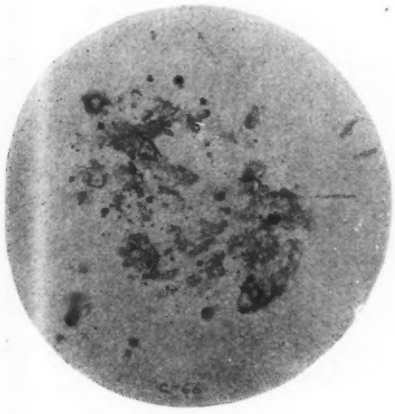
In general, cinders which have been classed as Very Heavy Staining and Heavy Staining were obtained from stockpiles and from plants in locations where there was considerable evidence of staining in concrete masonry structures. The same cinders also produced heavy stains when made into concrete masonry units in the laboratory.

Cinders classed as Light Staining and Very Light Staining came from areas in which stains in concrete masonry structures appeared to be much less prevalent, if not entirely absent. These cinders produced light stains when made into concrete masonry units in the laboratory.

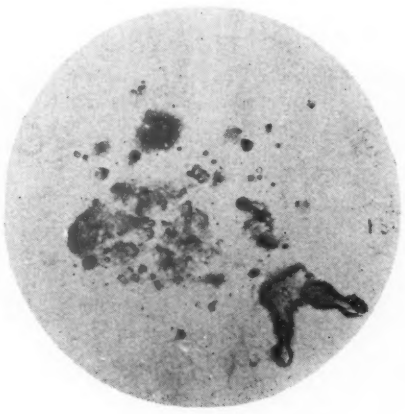
Conclusions Therefore, it seems reasonably certain that the use of cinders in the higher staining classifications should be avoided.

Records kept by block producers of the results of staining tests on their cinders and on the performance of their block in concrete masonry walls will aid materially in establishing the dividing line between staining and non-staining cinders. It is suggested that every cinder concrete masonry manufacturer avail himself of this method of maintaining control over the quality of his product.

It is suggested that cinder concrete masonry producers run tests as outlined to classify the degree of staining that may be found in cinders they are using. With this information as a guide, manufacturers can follow the method of treatment, either moist storage or lime, which appears most practical in reducing the tendency of the cinder aggregates to cause staining and pop-outs.



Heavy



Very heavy

Glasgow Corporation

(*from page* 142)

A specially-reinforced concrete raft was used to carry the structure because of the nature of the subsoil, while ground floors are of concrete, reinforced with B.R.C. square-mesh fabric.

Mixing chambers are on a second story at the rear above the filling molds and cement receiving points.

Special transport has been designed to carry the slabs. A low-level trailer with double rows of V-shaped steel ramps allows the transportation of eight slabs each trip, the slabs being securely held by specially designed clips. Foamslag was first used in an experimental block in Glasgow in 1938 at Carntyne, Glasgow and in 1941—a small scale experiment in the use of precast foamslag blocks saw a single room erected in the Amulree Street yard. In 1944, to satisfy the authorities as to the practicability of the scheme, a four-flatted block was constructed at Penilee. From all these experiments the virtue of the material was demonstrated and experience gained in its precasting which led to the decision to erect the factory now opened. It is possibly unique in Britain and is certainly the most modern erection of its type.

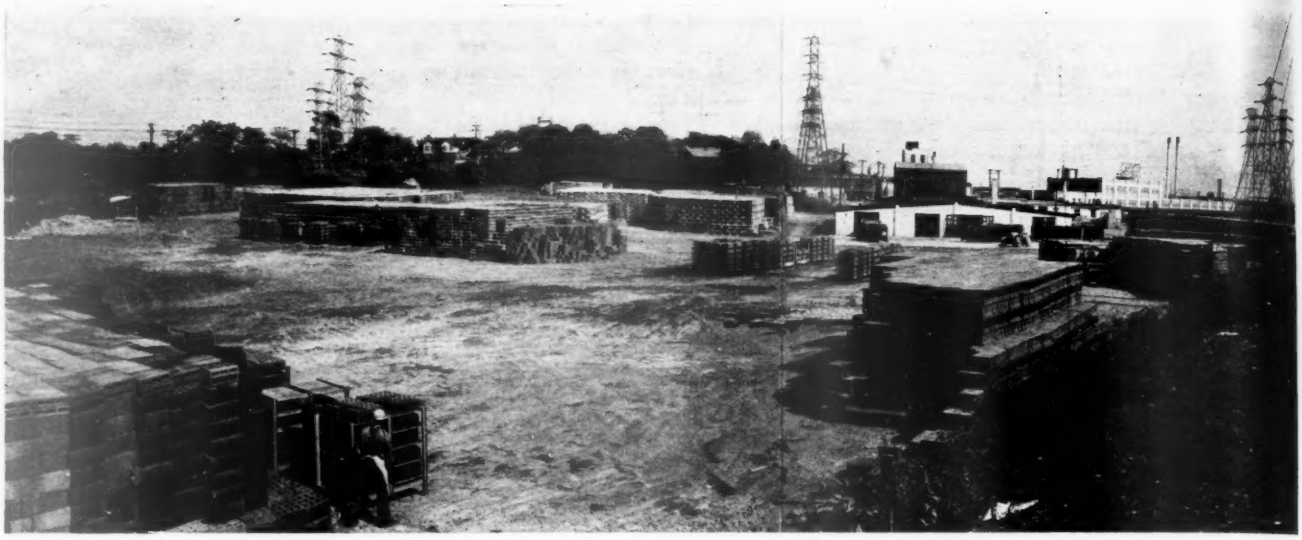
New Insulating Material Developed by Memphis Firm

Permastone, a new exterior covering for houses, has been put on the market by H. F. Vann & Sons Construction Company, Memphis, Tennessee. The material is described as a permanent, water and fireproof insulating agent. Cement and ground quartz are mixed and made into the required colors and sizes at the construction site.

During World War II the Good-All Manufacturing Company of Ogallala, Nebraska, turned out a radio impulse device which was an important part of the atomic bomb. Now the firm, headed by Bob Goodall, is building a two-story addition in which concrete slabs will be made for home construction.

Are you contemplating the production of sand and gravel or crushed stone? Several chapters in the Pit and Quarry Handbook give you the latest and most complete information on production methods and equipment.

Teamwork and Time Economy Win High Production for Paturzos



• A general view of V. Paturzo Brothers & Son's plant in Baltimore, Maryland, showing the large storage area adjoining the buildings.

another ON THE SPOT report

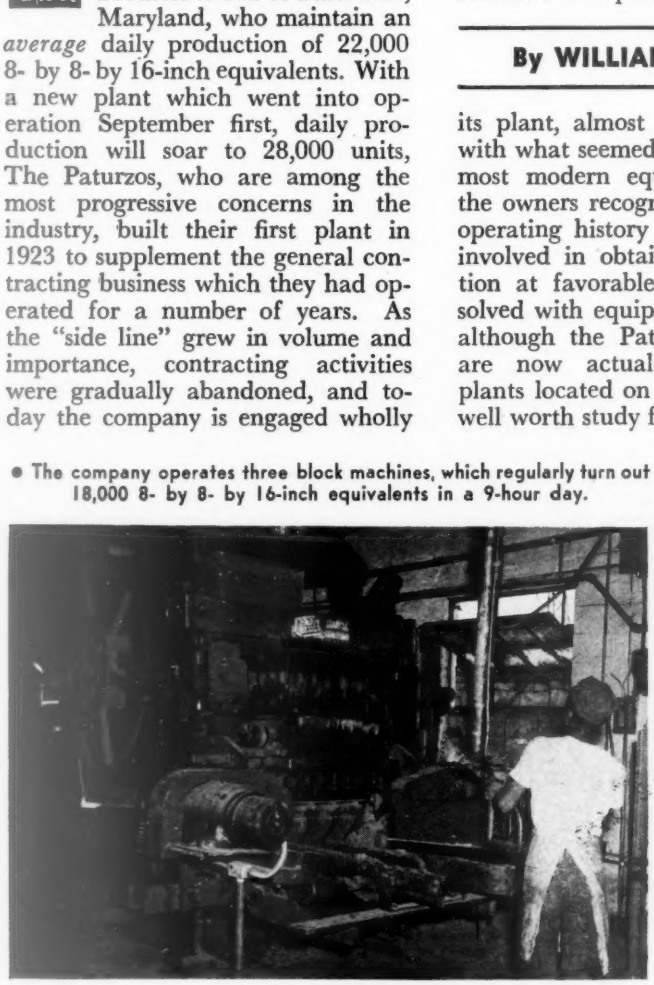
ONE of the largest producers of concrete blocks in the country is V. Paturzo Brothers & Son of Baltimore, Maryland, who maintain an *average* daily production of 22,000 8- by 8- by 16-inch equivalents. With a new plant which went into operation September first, daily production will soar to 28,000 units, The Paturzos, who are among the most progressive concerns in the industry, built their first plant in 1923 to supplement the general contracting business which they had operated for a number of years. As the "side line" grew in volume and importance, contracting activities were gradually abandoned, and today the company is engaged wholly in the production of concrete masonry units.

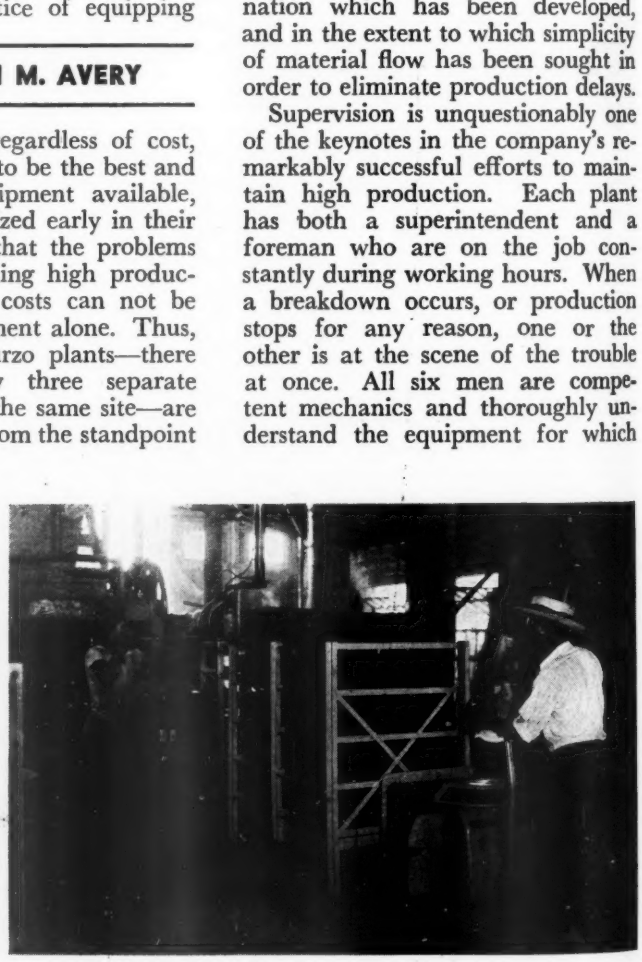
Although the firm has persistently followed the practice of equipping its plant, almost regardless of cost, with what seemed to be the best and most modern equipment available, the owners recognized early in their operating history that the problems involved in obtaining high production at favorable costs can not be solved with equipment alone. Thus, although the Paturzo plants—there are now actually three separate plants located on the same site—are well worth study from the standpoint of the equipment used, this article will be chiefly concerned with the admirably efficient personnel coordination which has been developed, and in the extent to which simplicity of material flow has been sought in order to eliminate production delays.

By WILLIAM M. AVERY

Supervision is unquestionably one of the keynotes in the company's remarkably successful efforts to maintain high production. Each plant has both a superintendent and a foreman who are on the job constantly during working hours. When a breakdown occurs, or production stops for any reason, one or the other is at the scene of the trouble at once. All six men are competent mechanics and thoroughly understand the equipment for which

• The company operates three block machines, which regularly turn out 18,000 8- by 8- by 16-inch equivalents in a 9-hour day.





• A source of recurring labor trouble was eliminated when battery-powered lift trucks replaced hand-operated models.

The belt conveyors, which feed aggregates from the ground-level storage bins, are cut off automatically by means of float switches in the volume batching boxes.

they are responsible. The immediate trouble is usually cleared up in a few minutes, for serious breakdowns are avoided by careful preventive maintenance of all the equipment. If a part requires replacement while the machine is in operation, it can usually be found in the $10,000 inventory of spare parts maintained on the site.

The management's interest in production delays goes far beyond the correction of the immediate trouble. A full report is made of all the circumstances attending any delay, and every effort is made to analyze the causes in order to prevent a recurrence. This practice is followed even when there is only a relatively small slump in production on any of the machines, with the result that even minor delays have been reduced to the vanishing point, and the company maintains month after month one of the highest production rates per machine to be found anywhere in the industry.

When the plants are operating smoothly, which they do practically all the time, production on three Besser Super Vibrapacs exceeds 21,000 8- by 8- by 16-inch equivalents per 9-hour day, although the manufacturer's rating on the machines would indicate that good production might approximate 16,000 units. The difference, amounting to about 5,000 units per day, represents an impressive bonus resulting from all-around good management, the employment of competent supervisors and the exercise of constant vigilance in the prevention of production delays.

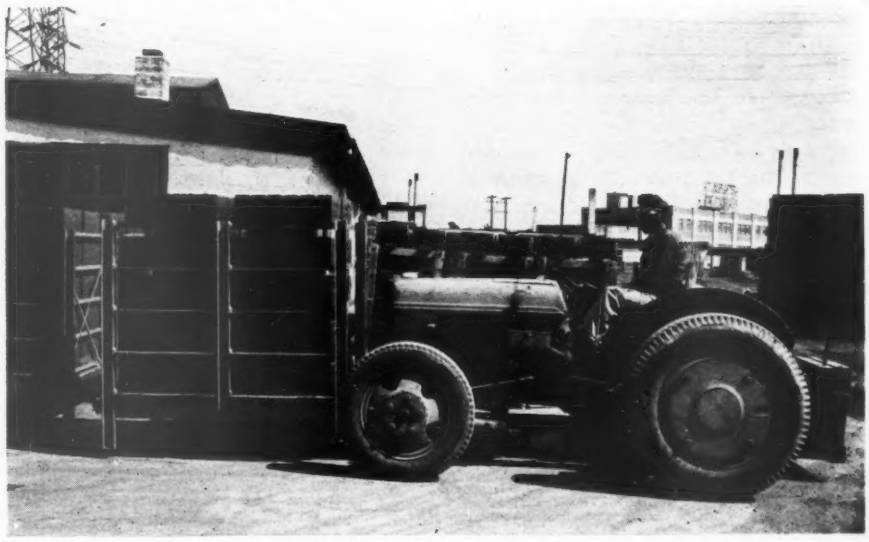
The oldest of the three Paturzo plants incorporates the conventional mezzanine-floor mixing layout, with a ground-level dumping bin, reciprocating feeder, bucket elevator and overhead bins. The owners found considerable fault with this arrangement of equipment, particularly on the ground that it was spread out too much for proper maintenance and supervision. They also felt that there were too many links in the system, and consequently too many points at which a simple mechanical failure could shut down the entire plant. Accordingly, when the new plant was laid out several years ago, it was decided to abandon conventional design practice almost completely, and to strive for the maximum possible simplicity.

The No. 2 plant, which incorporates two Super Vibrapacs, is unlike any other Besser plant the author has visited. Two 40-cubic-yard ground-level hoppers serve both as dumping bins and storage bins, eliminating overhead storage of the materials. The aggregates are fed by a belt conveyor to volume-batching boxes over the 40-cubic-foot Besser mixers, which are installed in deep concrete pits, with the tops of the mixers about flush with the plant floor. An ordinary float valve in each box actuates a mercury switch to stop the belt conveyor when the material reaches the required level. Quick stopping of the conveyor is effected by means of a magnetic brake. Bagged cement is moved by a belt conveyor from the receiving end of the building to a storage area between the two mixers. The mixers discharge their product into conventional skip hoists which elevate and discharge it into the feed hoppers above the block machines.

This batching system is as beguilingly simple as the foregoing description, and there is little more to be said about it, except that, on the basis of direct comparison with the conventional layout in the older plant, it has proved to be easier to operate, far more economical, and considerably less subject to costly breakdowns. Until some better system occurs to them or is developed by the industry, the Paturzos will be well satisfied with what they have.

In common with most block manufacturers throughout the country, the Paturzos ran into difficulty with the operation of hand trucks for moving loaded racks. The day of reckoning was deferred somewhat by assigning first, two and then, three men to a truck, but eventually, even under this arrangement, the men refused to do the work. The problem was solved about two years ago by changing to Automatic

• Tractors are used for handling the racks on the yard. The hydraulic lifting mechanism was designed by the Paturzos.



Transporter platform-type, electrically-propelled lift trucks. Three of these machines are now in constant operation and a fourth is on hand as a spare. They are used for transporting racks of green blocks from

The No. 2 plant (constructed in 1941) uses two 40-cubic-yard ground-level storage bins. All materials are delivered by truck.

the machines to the curing area, and later for moving them to a paved storage area adjacent to the building. From this point, three Ford-Ferguson tractors, equipped with special hydraulic lifting attachments developed by the company, are used to move the racks to the storage yard.

In addition to effecting a material reduction in labor costs, the change to battery-powered lift trucks has reduced production delays and eliminated congestion around the block machines. Most important, perhaps, it has removed a source of frequent irritation between employees and management.

The Paturzos have not so far been won over to the practice of steam curing. Water sprays and unit heaters are used in the large unpartitioned areas for storing green blocks at each plant. They find this practice wholly satisfactory, and considerably cheaper than steam curing. The company has always opposed the practice of shipping blocks 24 hours after molding them, and has adhered as rigidly as possible to a policy of maintaining a large stock in the storage yard. On occasion, as many as 1,000,000 units have been stored, and even during the peak of war demand a 6-week supply was usually maintained. This practice is almost a necessity due to the company's refusal to accept orders unless shipment at a specified time can be guaranteed. The Paturzos feel, and with some cause, that if this practice were observed more widely throughout the industry, it would help immeasurably to win more general support for concrete masonry units among contractors, architects and engineers.

There are no paved runways in the plant storage yard, the company's experience having established the principle that runways are a needless extravagance when Ford-Ferguson tractors are used. The yard is cinder-filled and drains well, and little maintenance is required. From time to time drags are pulled around the yard with a tractor to level the grade and eliminate ruts.

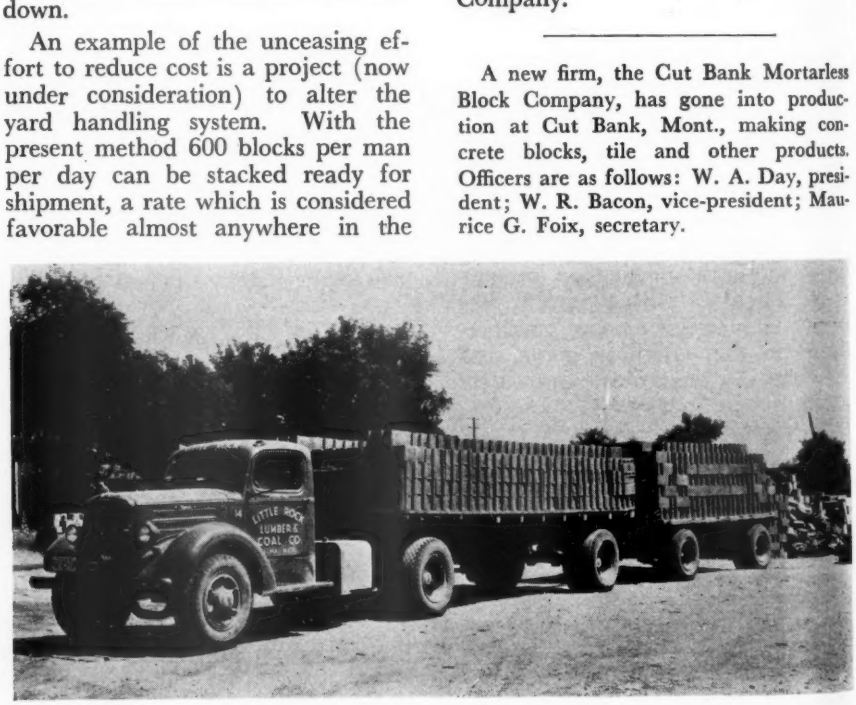
This company has always watched its labor efficiency closely, and has never hesitated to invest money in labor-saving equipment. It operated the first block machine in the city of Baltimore, and later undertook the first field installation ever made of the Besser Super Vibrapac. Down through the years this policy has paid rich dividends. At one time 60 men were employed to produce 18,000 units per day, whereas at present only 30 men are required for the same output. Obviously such economies can result only from the most careful study of all the details of the business. The O.P.A. ceiling price in the Baltimore area was 12½ cents for an 8- by 8- by 16-inch unit, one of the lowest prices on the east coast, and only by effecting every possible economy was it possible for the company to remain in business. Many of its competitors in the Baltimore area were forced to close down.

An example of the unceasing effort to reduce cost is a project (now under consideration) to alter the yard handling system. With the present method 600 blocks per man per day can be stacked ready for shipment, a rate which is considered favorable almost anywhere in the industry. The Paturzos, however, think it can be increased to at least 800 units per man by the installation of a central pneumatic unloader connected with the plant by a covered runway.

The company's usual practice is to build up its stock during the winter months in anticipation of heavy shipments throughout the summer. As many as 42,000 8- by 8- by 16-inch equivalents, including more than 20,000 8-inch cinder units, have been shipped in a single day. All the firm's publicity has been built around the trade name "Pat Blox", and this identification is prominently displayed on all delivery trucks.

Paturzo's annual output of 5,000,000 8- by 8- by 16-inch equivalents is normally sold within a 50-mile radius, approximately 20 percent going to farm users despite the fact that the company has made no effort to develop the rural market. For the past several years the plant's full capacity has been sold out at least six months in advance. A full range of sizes is produced, starting with 1½-inch furring units, in cinder, sand-and-gravel, and air-cooled heavy slag. Light-weight face units will soon be produced, using expanded slag furnished by the Baltimore plant of the Bethlehem Steel Company.

A new firm, the Cut Bank Mortarless Block Company, has gone into production at Cut Bank, Mont., making concrete blocks, tile and other products. Officers are as follows: W. A. Day, president; W. R. Bacon, vice-president; Maurice G. Foix, secretary.



• With rush calls for building supplies the order of the day, this two-trailer train, operated by Little Rock Lumber & Coal Company, Alma, Michigan, is always busy.

Two Fruehauf trailers, pulled by a big Mack tractor, haul up to 25 tons of concrete blocks in a single trip. The company uses this and similar equipment to serve retail and wholesale trade throughout an area covering a radius of more than 100 miles from their plant.

Earle Brenneman and Vern Kennett, operators of Little Rock, point out that the trailer delivery method means faster service at lower cost. The trailers, they say, last indefinitely and need not be tied up while tractors are being serviced. Moreover, the second trailer in the train can be left for unloading at a building site or dealer's yard, while the first unit goes on to make another delivery.

Spokane Operator Expands Facilities After Finishing War Job

By HARRY F. UTLEY

• A general view of the Seattle Layrite operations. The tall structure at the right (with elevator under construction) will store the pumice aggregate.

another ON THE SPOT report

JULES FRESE was in the concrete-products business in Spokane, Wash., during the early years of the war when he learned that a tremendous construction project of a highly-secret nature was to be undertaken near the cross-roads hamlet of Hanford, some miles southward from Spokane. Although he did not then know that this was to be the birthplace of the atomic bomb which was to help bring the war to a hasty conclusion, he did learn that there was a lot of construction of a top-priority nature to be done, both at the plant proper and to house thousands of workers. Although specifications in most cases called for monolithic concrete, Mr. Frese was able to get the War Department to agree to receive alternate bids on concrete masonry, won the contract, and during a two-year period produced more than 5,000,000 concrete masonry units of various sizes for the undertaking.

• Below: The fork-lift truck loading a cube of 12-inch units on a delivery truck. Right: The conveyor at the left feeds aggregate to the weigh hopper over the mixer. The conveyor at the right takes the concrete to the block machine.

Upon completion of the Hanford contract, the Besser Vibrapac and appurtenant equipment which produced the units near Richland, Wash., were dismantled and shipped to Seattle, where they are now in daily service in the Seattle plant of the Layrite Concrete Products Company.

There are now three producing plants in the Layrite chain... the one at Seattle, one at Spokane, and another at Kennewick, Wash. Each is equipped with a Besser Supervibrapac for molding the blocks, and, beginning this fall, light-weight units are being produced in each plant in addition to the regulation gravel blocks.

At the Seattle plant, aggregates are batched with Butler equipment and mixed in a 57-cu.-ft. Besser mixer. Standard practice dictates the use of high-early-strength cement, and Darex is regularly employed as an admixture principally to lower the rate of absorption of the finished units. Sacked cement is presently being used, although a Butler bulk-cement plant is on order. Storage bins for pumice were being erected in August, the material to arrive by rail and be elevated to the bins by bucket elevator from a track hopper, and reclaimed by tunnel belt-conveyor to the Butler weight batcher. The number of curing rooms will be increased from six to nine by the end of the year, the three new tunnels to be 9- by 75-ft.

in size, as compared with an existing kiln of 9 by 50 ft.

Power-operated lift trucks are used exclusively at the Seattle plant, platform units being employed to handle the racks, both empty and loaded, while fork-lift units are used in the yard to load trucks from stockpiles, where the units are stacked in cubes for mechanical loading with the fork lifts. These power trucks were designed and built by the company and so successful have they proved in service that a Seattle machine shop, the Truax Machine and Tool Company, has taken over the manufacturing end and is now producing them for sale to concrete-products plants and for other materials-handling service.

The Layrite plant in Spokane is also undergoing a program of improvment at present involving the installation of bulk-cement and pumice-handling facilities. The Spokane cement storage is unconventional, being underground and of concrete construction. It is located beneath the railway spur tracks adjoining the plant and is thus convenient for direct receipt of cement from the special covered hopper cars. A screw conveyor will carry the cement from the below-ground storage to an elevator at the plant.

Close by the cement storage a concrete track hopper has been constructed for receiving the pumice which will also come in by rail. A belt conveyor will carry the pumice from below the tracks to the plant, an elevator lifting it to the supply bins. This conveyor will be reversible, to allow excess material to be stockpiled at the opposite side of the tracks convenient for reclaiming by the same conveyor.

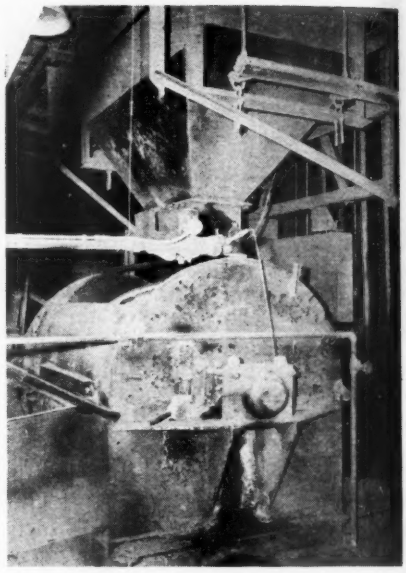
• A view of the Spokane Layrite plant and yard.

Otherwise the flowsheet of the Spokane plant, as well as the equipment, is similar to that employed at Seattle, bins and batching equipment having been supplied by Butler; and power lift trucks of the same type are used to handle the racks and blocks.

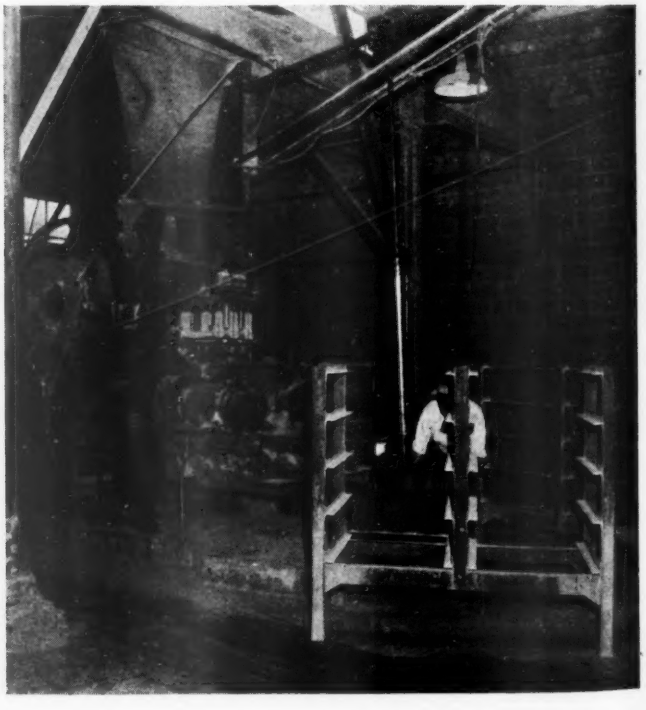
The plant at Kennewick employs, in general, the same type of equipment used in Seattle and Spokane. At this plant, however, the concern produces its own sand and gravel from a small plant having a daily capacity of about 100 cu. yd.

An excellent grade of pumice to be used in the three plants comes

(*Continued on page* 152)



• The weighing hopper and mixer at the Spokane plant.



• Below, left: Verne Frese standing under the loaded fork-lift.

• Right: The Vibrating block plant at the Spokane plant.

DEPENDABLE 'INCOR' HIGH EARLY STRENGTH SPEEDS ERECTION OF TWO PRECAST WAREHOUSES

Ready Mix Concrete: Sheesley Supply Co., Johnstown, Pa.
Contractor: Corbetta Construction Co., New York.

READY MIX Plant Customers ask for 'Incor' 24-Hour Cement because they want to save time, reduce form costs and keep Winter jobs on schedule.

Combining the characteristics of monolithic construction with light weight and economy in material and labor, the two one-story, 3-acre warehouses at Naval Supply Depot, Mechanicsburg, Pa. made construction history. Tradition was put aside—instead of stripping forms from concrete, the concrete was stripped from fixed forms in the casting yard. Columns, hollow-box girders and roof slabs—3,956 units in all—were precast at job site. Using 'Incor', a day's output was based on casting and lifting members from 105 molds of 20 different types.

Casting was done in cold-weather months, but units were lifted in 24 hours or less. Molds of 'Incor' concrete, with their tough surfaces, were used 48 times and could have been used indefinitely. 'Incor' speeded production with maximum economy.

Another reason why leading Ready Mix Operators provide 'Incor'*—America's FIRST high early strength Portland cement—at all times, as part of their good service.

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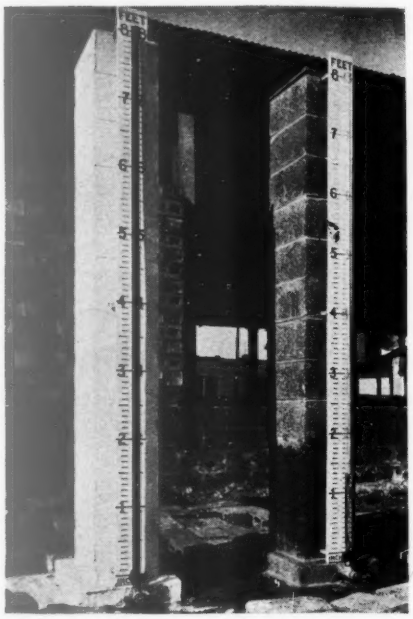
New Damp-Proofing Material Causes Acrimonious Debate

THE December 15, 1945, issue of *Forbes* contained an apparently innocuous article on "Dry cellars," authored by a Mr. Kurt Steel, who had experimented in the cellar of his own



A view showing results of a test of two 8-ft.-high cinder-block towers, one treated with Aquella, the other untreated. Water flowed through the cinder units in the right-hand (untreated) tower at the rate of more than 2 g.p.m. The treated column (left) remained full of water for three weeks. It is said to have shown no visible surface moisture during that period.

home with a then relatively unknown damp proofing compound called Aquella. Mr. Steel's article, a condensed version of which appeared in the January, 1946, issue of *The Reader's Digest* under the more glamorous title, "Water, Stay Away From My Wall," touched off a battle royal involving Prima Products, Inc., manufacturers of Aquella, the National Bureau of Standards, the Federal Trade Commission, and several concerns whose damp-proofing materials had not enjoyed similar publicity among the *Digest's* 4,500,000 readers.

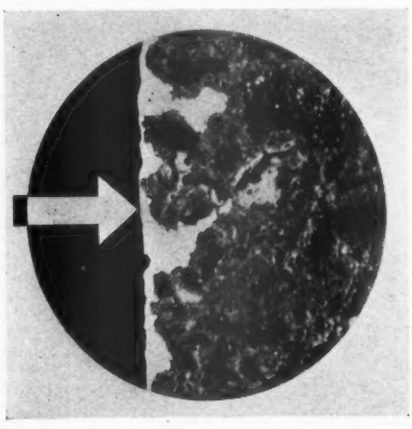
On the face of it the volume of noise which has resulted might appear to be all out of proportion to the gravity of the subject matter, but a great many American homes are cursed with wet cellars, and a rather startling number of American home owners read the *Digest*. The facts are of interest to the manufacturers of concrete building units because their product comes in (rather unjustly) for a liberal share of the blame in connection with wet cellars. In recent years certain progressive members of the industry have, at least tacitly, recognized this situation by stocking and selling damp-proofing compounds and paints to be applied to masonry walls in place. Many feel that this practice is simply an intelligent acceptance by the block maker of some responsibility for seeing to it that his product enjoys the best possible opportunity to perform satisfactorily.

The violence of the charges and countercharges concerning Aquella resulted largely from a reference in the Steel article to findings of the National Bureau of Standards. "Samples of the white powder," the article stated, "were submitted to the cold-eyed researchers of the National Bureau of Standards. Only a short time before the Bureau had made 30 different waterproofing tests. Twenty the Bureau called 'very poor,' five 'poor.' Only two were rated 'excellent'—and both called for specially built walls. Tests won Aquella a rating of 'excellent' on ordinary brick or concrete walls, and whether applied on the inner or outer face."

Subsequently the Bureau, in a letter addressed to B. C. Forbes Publishing Co., Inc., took issue with the article, declaring that it contained "false and misleading" statements. Copies of this letter were distributed far and wide. When the matter was referred to the then Secretary of Commerce, Henry A. Wallace, Mr. Wallace in a letter to the manufacturers of Aquella, retracted the Bureau of Standards letter, stating: "The Bureau stands upon the complete report of water permeability tests on coatings of 'Aquella' paint applied to masonry walls dated December 8, 1942, on file in the office of the National Bureau of Standards."

Although the product Aquella is a comparative newcomer in the United States, it was actually developed in France more than ten years ago to keep underground water from invading the corridors, ammunition rooms and barracks of the Maginot Line. Alarmed by the amount of water entering the fortifications through the concrete walls, the French Government had offered a substantial reward to anyone who could solve the problem. One of the compounds submitted was Aquella, and after thorough testing this material was specified for use wherever water seepage occurred in the fortifications.

An enlarged photograph of a sawed section of masonry which shows the penetration of the pores. According to the manufacturer, the material expands minutely as it sets.



The Line, of course, failed but it was for other reasons than water seepage, and when René Haguenauer, holder of the Aquella patent, fled France before the advancing Germans, he brought the formula for its manufacture to the United States. After a number of tests in this country under a wide range of conditions, Aquella was placed on the market by Prima Products, Inc.

Aquella is a white, non toxic, finely-ground mineral powder consisting of about 43 percent silica, 38 percent calcium oxide, 7.3 percent alumina and small amounts (less than one percent) of magnesia, sulphuric anhydride and iron oxide. The material is sufficiently fine (down to one micron) that it penetrates the pores of a masonry surface, forming a non-reversible stable salt by chemical reaction with the calcium oxide in the masonry. The resulting compound forms a protective surface within the pores of the wall materials. In addition to its damp proofing properties, Aquella produces a smooth, egg-shell surface suitable for a finish coating on either interior or exterior surfaces. Where colors other than white are desired, any type of paint may be applied over the treated surface after a suitable interval for curing.

Dry Aquella is mixed with cold water in the proportion of one bag (8.4 pounds) to 3 quarts. It is scrubbed into the masonry surface (which must be free of dirt or coating materials which might prevent bonding) with a stiff-fibre brush. The masonry must be thoroughly saturated with water not only before the application, but must be kept moist for at least 48 hours afterward. Two coats are recommended for most work, using Aquella No. 1 for interior application and No. 2 for exteriors.

Concrete block manufacturers are a fairly skeptical crew, and many will want to see at first hand what results can be achieved with this new damp-proofing material. The makers of Aquella have been increasing production by leaps and bounds to keep up with the large demand stimulated by the *Digest* article and subsequent wide publicity, and there should soon be an abundance of evidence in all communities to settle once and for all the claims and counterclaims.

Spokane Operator

(*From page* 150)

from a deposit owned by Mr. Frese. It is located at Cosmos, Wash., about 40 mi. southeast of Seattle on the lower slopes of Mt. Rainier and is believed to have been deposited many centuries ago when this famous peak was an active volcano.

Mr. Frese retains a half interest in each of the three plants operating under the Layrite name. His partner at Seattle is his son, Verne; at Spokane H. E. Lutes is co-partner and general manager. Harold Ross is part owner and operator of the Kennewick plant.

Cornerstone of Success

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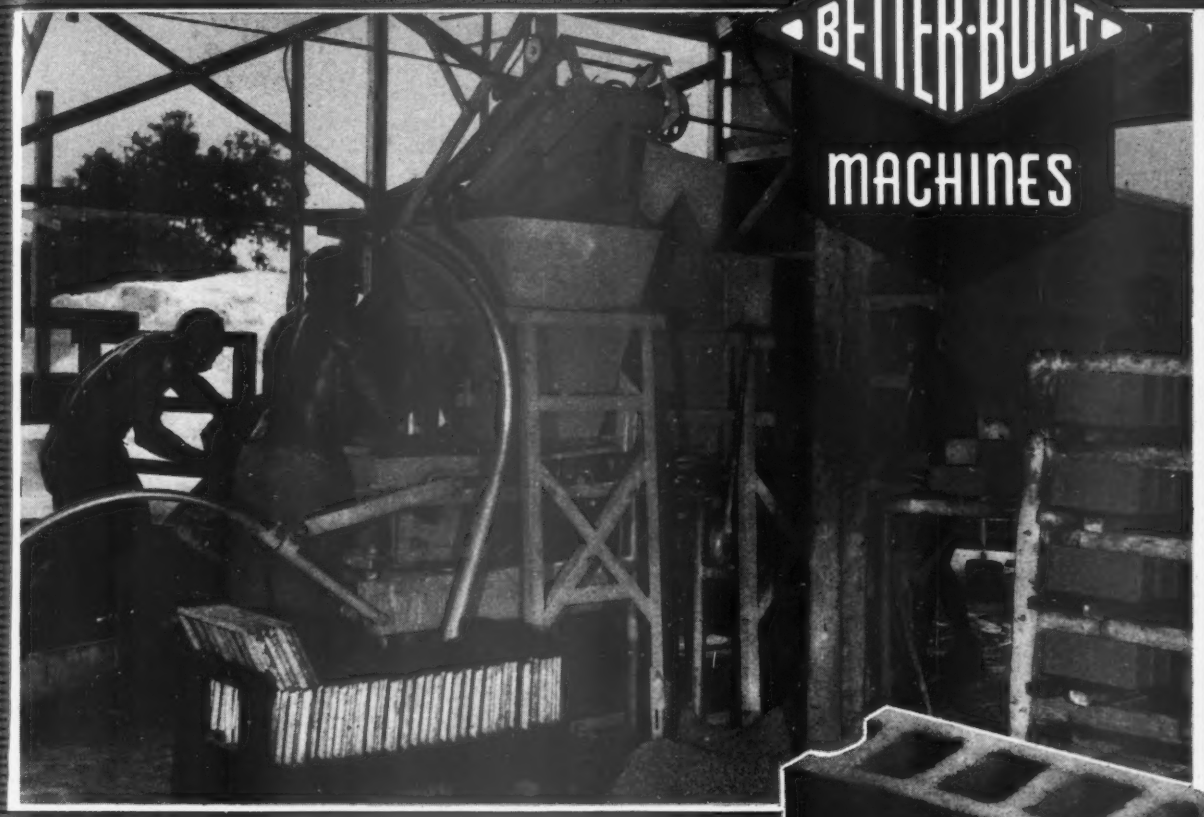

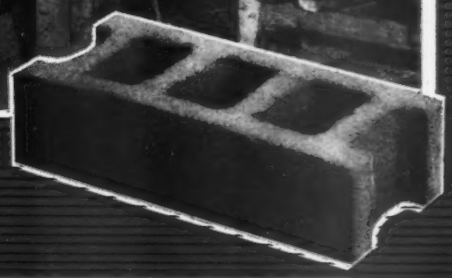

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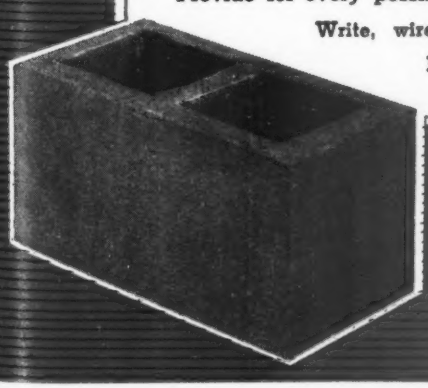
Operators old and new are stepping up production and improving the quality of their blocks and increasing profits thru Graveley "Better Built" Concrete Block Machines. Put a Graveley to work for you. One machine makes eight sizes of blocks, a truly versatile, practical money-making machine. There are two models, a 2-cell and a 3-cell, both two unit jobs. Two Graveley machines operating from a single mixer and conveyor will produce well over 3,200 blocks a day. *Put this Graveley job to work for you.* Provide for every possible customer demand in both style and size range of block.

Write, wire or phone today for complete details, literature and prices. Reasonably prompt deliveries are now possible.



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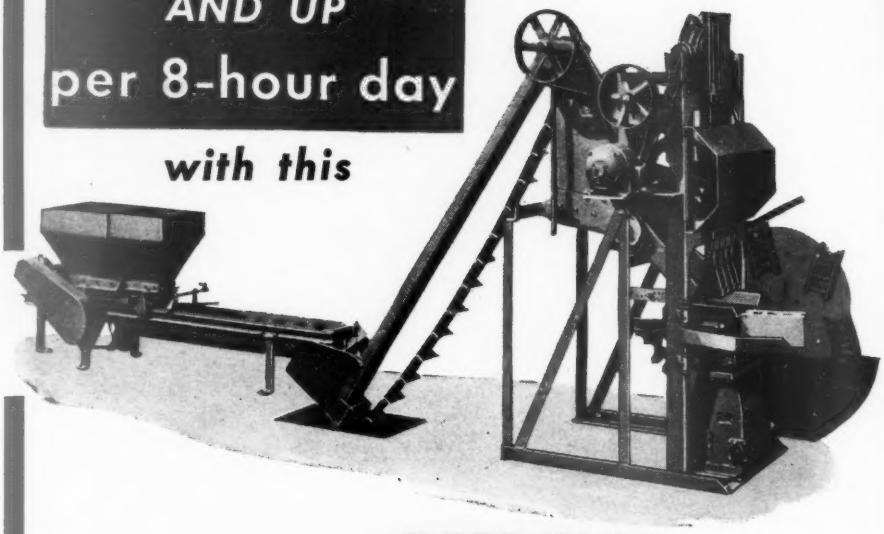
GRAVELEY BETTER-BUILT MACHINERY

1000 BLOCKS AND UP per 8-hour day with this



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HERE, at an attractive price, is the ideal outfit with which to launch a new business or expand present facilities.

Buy this complete *motorized KENT plant. Install the various coordinated machines in compact space guided by the simple and explicit instructions furnished. Everything needed is included.

Then you will be ready to make concrete products with equipment that has a record for practical and profitable production in plants throughout the country.

At less than the usual manpower cost the KENT *Continuous Mixer delivers well-mixed concrete in a steady stream to the KENT Elevator which raises it to the KENT Feeder. From this the concrete flows into the easily operating KENT Stripper. The pull of a lever brings the KENT Tamper into operation for speedy tamping of dense block. The lever-operated hopper "strikes-off" the blocks smoothly. It is then raised by an easily operated lever and swung to one side on the "off-bearer". At the right of the stripper stands the KENT Dunker which keeps pallets constantly in fine condition. Not illustrated but furnished are 1000 pallets, 25 three-deck curing racks and a Weld-Built lift truck.

*Larger KENT plants are available; also units for belt drive and combinations having the KENT Batch Mixer, instead of the Continuous Mixer. Use the coupon below to obtain any desired information quickly and easily.

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Send complete information and prices as checked below.

☐ Plant illustrated above ☐ Plant with Batch Mixer

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NEW MACHINERY and SUPPLIES

● Moisture Meter

The percentage moisture in concrete sand can now be read directly from an instrument which has been placed on the market by J. Thos. Rhamstine, Box 289, Harlingen, Tex.

Indicator of moisture content.

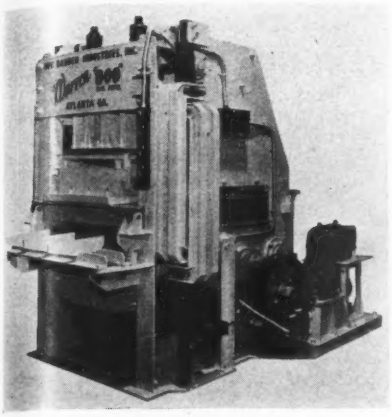
The device consists of two parts, the pick-up or prod and the meter box, which are connected by a cable. The prod can be left in the batching hopper, and the meter will give an instantaneous and continuous report on the moisture content of the sand. The dial is accurate to 0.25 percent of moisture.

The principle upon which the meter operates is the change of a.-c. impedance in the water-sand mixture. The source of power is a 2,000 c.p.s. audio generator furnishing a low value a.c. to the prod plates. The four plates themselves (two pairs) are of stainless steel and are set at 90 degrees to each other. To take care of the residual mineral salts in the sand, the user makes a calibration for his particular sand when installing the meter. This procedure is explained in the instructions. It need only be done once, unless the character of the sand changes.

● Big-Time Block Machine

The "Warren 800," a new concrete block machine that will produce 800 or more standard blocks (8- by 8- by 16 inches) an hour, or almost 10,000 concrete bricks an hour, has been announced by Roy Darden Industries, Inc., 313 Bona Allen Bldg., Atlanta, Ga. It is a machine that has been designed for the big operator, and will give a fully compacted, even-density block—one that will meet all the latest engineering standards. The height of the block is held to 1/32-inch tolerance. The 8- by 8- by 16-inch blocks

(or equivalent) are made on one 9-pound plain plywood pallet, which is rustproof and lightweight. Concrete will not collect on the pallet, which requires oiling only once every two weeks.



Will make 800 blocks per hour.

The machine is entirely automatic, requiring the services of only one man at the front of the machine for offbearing. Syntron-Magnetic vibration is used on the mold box and leveling head, and the entire machine is driven by one 5 hp. gear-head motor, in addition to the agitator motor.

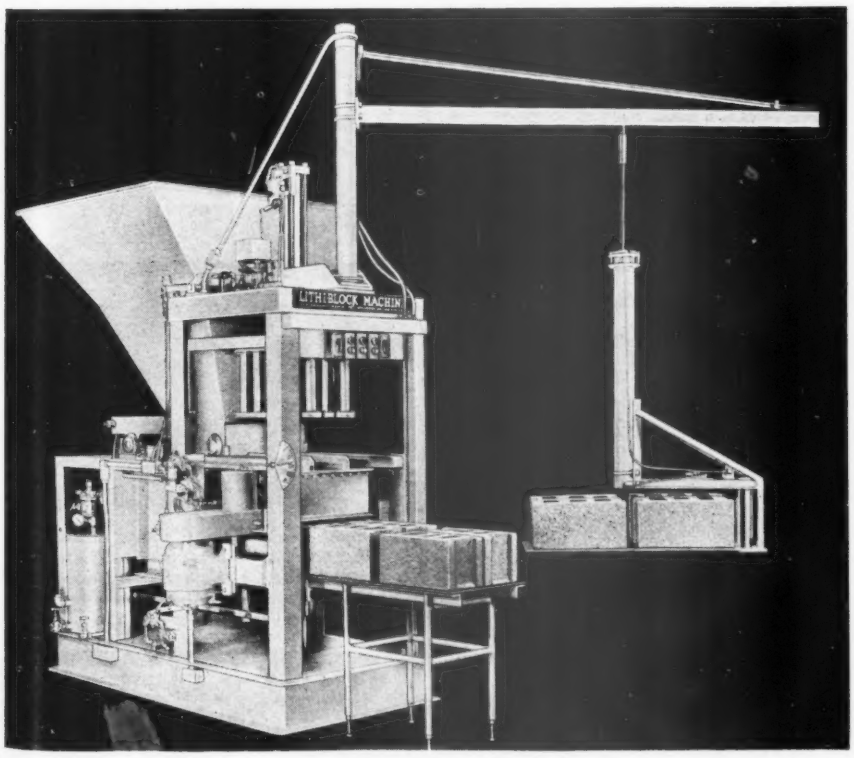
New Continuous Block Maker

The Lith-I-Bar Company, Holland, Michigan, makers of the Lith-I-Bar continuous concrete-joist machine, announce the new Lith-I-Block machine which will soon be available to producers. While new to most of the industry, this machine is the result of 12 years of experimentation, study and operation. The final model offered is said to have operated steadily for over a year producing at the average rate of 480 standard 8- by 8- by 16-inch blocks per hour.

The Lith-I-Block is an automatic, plain-pallet, vibrating stripper block machine of simple and compact design without sacrifice of sturdiness. Its base measures 3 by 6½ feet and it is 6½ feet high overall. Being almost vibrationless, it requires no special foundation and does not need to be bolted to the floor.

The major operations of the machine, including the pallet feed, are performed by air-oil cylinders, only the feed agitator drive and the vibrators being operated electrically. There is no timing cycle but the machine sets its own pace, with one operation following another automatically in sequence. Thus if one operation should fail, the machine automatically stops. The only non-automatic step is the timing of vibration, which is controlled by the operator through a push-button switch on one of the offbearer handles. The stripping starts automatically when vibration is stopped but the stripper head can be held in a raised position for inspection or the removal of foreign matter, or dropped repeatedly when desired by means of a second push button switch. Repeated dropping makes it possible to allow for variations in mixes, aggregates, etc., and to bring an off batch down to the required height.

One mold box makes all the desired sizes from 4-inch height up to 16- by 16-inch chimney blocks 8 inches high by changing only the liners, the cores and the head. When there is no height change, this is said to take only 10 minutes; otherwise 30 minutes are required. The wear on cores and mold box liners is said to be slight; the original machine has produced over 350,000 blocks with no replacements. This is attributed to the method of vibrating on a horizontal plane without scouring action, to which is also credited the fact that the plain



Vibrating stripper machine.

THE SALSBURY TURRETEER

RELIEVES 3 TO 5 MEN

- One Turreteer will do work of 4 to 6 men—quickly pays for itself.
- One truck will handle output of two blockmaking machines.
- The Turreteer is unusually fast (up to 8 m.p.h.), maneuverable, rugged, stable.
- Power plant and drive wheel are a single unit. Turret revolves to change direction.
- Articulation smoothes out the bumps.
- Four wheels under load at all times.
- Capacity: 4000 lb. load plus driver. Will negotiate steep ramps.

Write for Bulletin TTB-1

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"KNOW HOW" FACTS

for making larger profits in CONCRETE BLOCKS

Write for it TODAY

This bulletin is a guide to "Better Business" for alert block producers.

It's packed with facts showing how Commercial Cored Pressed Steel Pallets insure a lower first investment . . . lower operating costs . . . top quality product.

THE COMMERCIAL SHEARING AND STAMPING CO.

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steel pallets used have not had to be cleaned or oiled during this period.

The machine makes two standard 8- by 8- by 16-inch blocks or one 8- by 16- by 16-inch chimney block on a pallet. These are discharged on a frame from which the pneumatic offbearer removes the pallets two at a time to the racks. This offbearer has long prongs which slide under both pallets and in one move fills a section of the rack for its full width.

Operation of the new machine was described in detail in a plant article which appeared in the October, 1946, issue of *The Concrete Manufacturer*, page 138.

● Turret-Steered Truck

The "Salsbury Turreteer" power truck, marketed by Salsbury Motors, Inc., 1201 Lexington, Pomona, Calif., is available in three models, a lift type, a tractor type, and a cargo type. All are powered by one-cylinder, four-cycle gasoline engines, which develop four to five hp. The motor is mounted in the turret and is completely enclosed. The vehicle is steered by turning the entire turret; it may be reversed by turning the turret 180 degrees. The throttle control is the inside ring on the top of the turret, while the outside ring is used as a steering wheel.

Lift-type truck.

The lift type truck (illustrated) will elevate a standard skid three inches, and will handle a capacity load of 4,000 pounds. It will haul this load up a 15 percent grade or ramp. The articulation feature built into this model provides stability of load and smooth operation over ramps, ridges, chuck holes or rough ground, by providing a "hinge" between the turret and platform. The load is elevated by means of a hand-operated hydraulic pump.

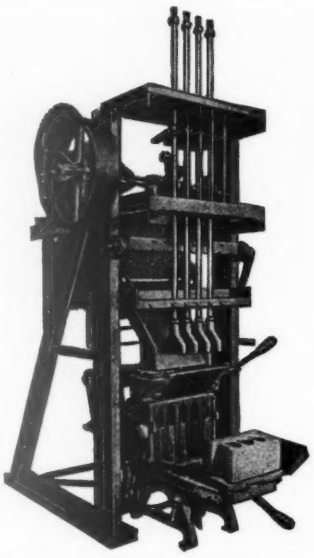
The tractor model will handle a trailer load of up to 12,000 pounds on level ground.

The cargo model Turreteer can serve as either a tractor or cargo type, and will handle the same loads as the lift or tractor models. It has platform space with removable sides.

Brakes on all models are of automotive-type, internal-expanding, two-shoe construction.

● Portable Conveyor

For handling concrete products and packaged or bagged material, the E. C.



Recognized Everywhere

The Hobbs Jr. Face-Down Block Machine is recognized everywhere as the great general purpose machine of the concrete-products industry. Famous for its wide range of sizes and the variety of blocks it can produce. As illustrated, it is equipped with striking and finishing device, shown under the floor-type tamper and with power feeder.

Stearns Clipper Stripper Machines; Stearns Jolterete Machines; Stearns Mixers; Cast Iron and Press Steel pallets. Straublox oscillating Attachments, etc. Repair parts for: Anchor, Stearns, Blystone Mixers and many others.

ANCHOR CONCRETE MACHINERY CO.
1191 Fairview Ave. Columbus, Ohio

IMMEDIATE DELIVERY

FAST--

Immediate delivery on both Block Machine and Mixer . . . .

- Block machine price $375 F.O.B. Knoxville.
- Capacity 60 blocks per hour.
- Plain pallet press
- Attachments available for several sized blocks.

C. M. Wooten Co.
2716 N. Central Knoxville, Tennessee

***Come On! Jump Into* THE FREE-FOR-ALL!**

For the Free-For-All is a book — a highly interesting book filled with pictures, layouts and descriptions of Ready-Mixed Concrete plants, Central Mixing Plants . . . and Concrete Block Plants. Send for it. It's free for all.

★

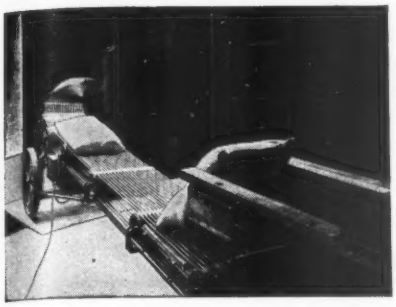
BUTLER BIN CO.
WAUKESHA, WIS.

ERIE
PORTABLE PLANT
MAKES CONCRETE
ON THE JOB

● Make 20 to 40 yards of specification concrete per hour on the job. One-man operation and a helper to handle cement bags. One hour to set up. Moves from job to job. Write for booklet.
6611 GEIST ROAD

ERIE STEEL CONSTRUCTION CO · ERIE, PA.
AggreMeters · Buckets · Concrete Plants · Traveling Cranes

Horne Machinery Company, Denver, Colo., offer a portable, wheel-mounted conveyor with adjustable inclination. Ma-



Can go around corners.

terial in units not heavier than 200 pounds can be moved around curves up to 90 degrees, or up a 12 degree incline. Both ends are adjustable in height while unit is in operation. The conveying medium on this conveyor consists of an electric driving motor and multiple endless steel springs operating over 6-inch diameter grooved steel rollers at 20-inch intervals. It is powered by a 1-hp. gear-end motor, with reversing switch, through a roller chain drive on the center roll of the conveyor. A standard unit is 26 feet, 8 inches long and 20 inches wide.

The Midwest Hollostone Company, manufacturers of concrete building tile, have started construction of a new plant at Fremont, Neb. It will have an annual capacity of 1,500,000 units or blocks. A crew of 12 men will be employed, it was stated by Don S. Wightman, owner. The Fremont site was chosen, he said, because of the availability of sand, gravel and other materials.

Harry Vines has been made sales manager for the Noble Company of Oakland, California, manufacturers of batching plants.

TRADE LITERATURE

YALE CUTS HANDLING COSTS FOR THE BUILDING BLOCK INDUSTRY. 4 pages. Yale & Towne Manufacturing Company, 4530 Tacony Street, Philadelphia 24.

REX MORTAR AND PLASTER MIXER. Bulletin 46-11. 6 pages. Chain Belt Company of Milwaukee, 1600 W. Bruce Street, Milwaukee 4.

STEARNS CLIPPER STRIPPER SERVICE MANUAL AND PARTS CATALOG. *38 pages. Compiled by the Stearns Manufacturing Company, Adrian, Michigan. Free to owners of Stearns Clipper Stripper block machines.*

A loose-leaf manual of eight sections, including such topics as Preparation of the Mix; Maintenance, Lubrication and Service; Model Conversion; Parts Catalog. Contains numerous tables, lists and diagrams.

FOR SALE

1—60 cu. ft. stationary concrete mixer designed and built for concrete block or masonry mfg. This mixer is in very good condition.

1—29 Stearns Jolterete Concrete Block Machine, automatic carriage drive and power off-bearer, complete with 60 cubic foot mixer, practically new.

800 steel pallets, in good shape, for Besser Tamper machine.

1—10 S Jaeger Concrete Mixer, complete with 20 foot extended skip hoist.

1—Barrett-Cravens 4000# capacity electric lift truck, almost new, in very good condition, complete with General Electric Battery charger.

SERVICE EQUIPMENT COMPANY
St. Louis, Mo., P. O. Box 52 Tel. Terryhill 3-2434

USED MACHINERY FOR SALE

3—Appley machines, 1946 models, perfect condition, with all attachments
6000—8x8x16" Pallets
3000—4x8x16" Pallets
1—12 cubic foot Mixer
1—23' 12" Belt Conveyor
1—Three-way hopper

Equipment in operation, priced right for quick sale, immediate delivery

CEMENT BLOCK INDUSTRIES
6th Avenue and 31st Street, Tampa, Florida
Phone Y-1529

IMMEDIATE DELIVERY

Practically new Stearns latest Clipper block machine, skip hoist and mixer with button controls, complete with motors. Also five year old Stearns equipment complete with motors. Can furnish pallets and racks for complete plant.

Box No. 1102, c/o Pit & Quarry Publications
538 South Clark Street Chicago 5, Illinois

FOR SALE

Stearns-Anchor double bar tamp machine with 8"-12" attachments, 7½ HP Fairbanks-Morse motor, Kent continuous mixer, 8 ft. trough, approx. 2000 8" and 1800 12"—40% air space cast iron pallets, belts, pulleys, pulley shaft, hoppers, hand-off bearer attachment, all in excellent condition. Reasonable. Call Plaza 2763 or

HOUGHTEN CEMENT BLOCK COMPANY
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FOR SALE

600 18 x 12½ plain steel pallets, never used, 45c each. F.O.B. Kalamazoo, Michigan.

DIETERMAN BROS.
P. O. Box 231 1601 Ravine Road
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CINDER BLOCK PLANT

Equipment for sale

Besser 21 cu. ft. mixer
Root vibration-compression machine
Pallets; pallet dunker; 40 steel racks; 2 hand lift trucks

See this equipment in operation

CINDER PRODUCTS CORPORATION
75 Ellenfield St. Providence, R. I.
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CINDER CRUSHERS

10 to 20 tons per hour capacity $345
25 to 50 tons per hour capacity 795
Vibrating screens 495

Guaranteed

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1100 Bellview Columbus 7, Ohio

FOR SALE

Hyster Lift Truck Model H.A.J.E., 4,000 lbs. capacity, 10 ft. lift, $2,600.00.

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CONCRETE BLOCK PLANT

1—Besser tamper (Victory model)
1—Besser mixer—32 cu. ft.—3500 pallets
58—Steel racks . . . Cap. 2280 per day
Spare parts, complete with motors, wiring and switches.

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FOR SALE

900 steel 10" 40% air space pallets, and 1425 steel 12" 45% air space pallets. Good shape, ready for prompt delivery.

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Freeport, Illinois

FOR SALE

No. 2 SHERMAN CONCRETE PIPE MACHINE

Will Make Through 36" Diameter Pipe
One 18 Cu. Ft. Stearns Mixer
One Skip and Hoist

4", 6", 8", 10" 12", 15" and 18" Bell & Spigot Equipment. 15" and 18" Tongue & Groove Equipment.

90 days delivery on this machine and equipment. Now in operation.

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Equipment for manufacturing 4 and 6 inch concrete sewer tile, also concrete culvert pipe 12 to 36 inch diameter.

F. M. REEVES & SONS, INC.
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POSITION WANTED

Executive, 43, owner and manager of large concrete products plant has sold out all interests and is available for plant manager, production supt. or will purchase interest in going concern handling builders' supplies, manufacturing concrete block, etc. Prefer Virginia, North or South Carolina, Florida, or Georgia territory. Write:

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538 South Clark Street Chicago 5, Illinois

W A N T E D

2 Concrete pipe machines, and the forms, mixer, wire rolls, welder, and any other necessary equipment. If used, must be in first-class mechanical condition.

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FOR SALE

Transit Concrete Mixers 1.9 Yard Capacity complete with trucks. Reasonable.

W. G. BLOCK CO.
Davenport, Iowa

FOR IMMEDIATE SALE
Concrete Block Machine

Which makes 1100 to 1200 blocks per eight hour day
Will make 4", 8", and 10" blocks, 9 cu. ft. mixer in good shape.
Both machines ($1,000) one thousand cash F.O.B. Dresden, Tennessee.
Also about (3500) thirty-five hundred pallets at fair price.

DRESDEN CONSTRUCTION COMPANY
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Increased workability... reduced breakage of thin shell units...with Lehigh Air-Entraining Cement

Building Units, Inc., of Primos, Pa., is another of the many concrete products manufacturers who are finding Lehigh Air-Entraining Cement a factor in producing stronger, better-looking products . . . in securing smoother operations, with fewer culls and throwbacks.

Is there room for these improvements in *your* products? If so, why not try Lehigh Air-Entraining Cement? Put it to a test, using your own aggregates, and compare results with those you are now obtaining. Our Service Department will be glad to help with any specific problem you may have.

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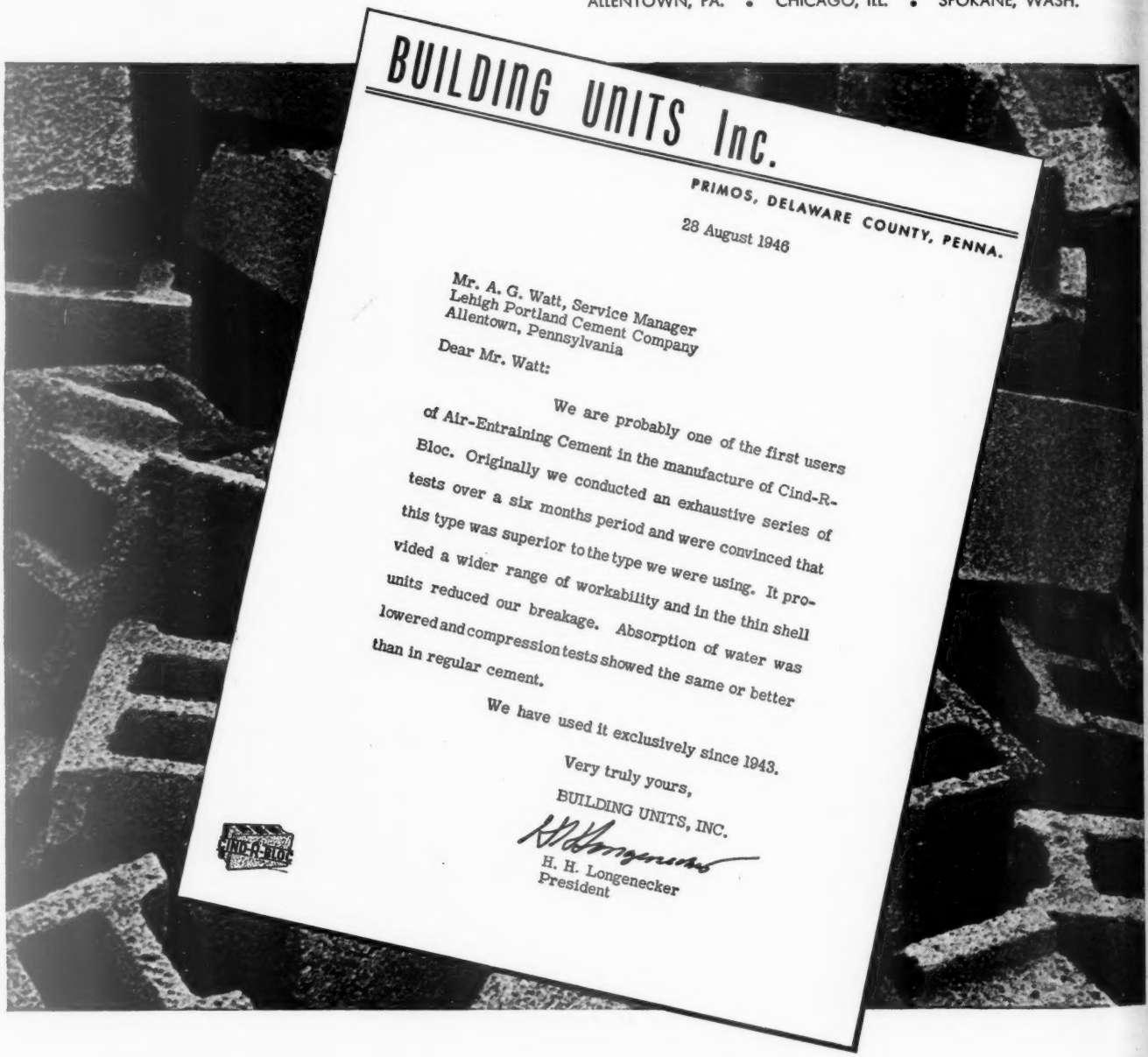

BUILDING UNITS Inc.

PRIMOS, DELAWARE COUNTY, PENNA.

28 August 1946

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Lehigh Portland Cement Company
Allentown, Pennsylvania

Dear Mr. Watt:

We are probably one of the first users of Air-Entraining Cement in the manufacture of Cind-R-Bloc. Originally we conducted an exhaustive series of tests over a six months period and were convinced that this type was superior to the type we were using. It provided a wider range of workability and in the thin shell units reduced our breakage. Absorption of water was lowered and compression tests showed the same or better than in regular cement.

We have used it exclusively since 1943.

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